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D.T1.1.1
Report on good practices about sustainable tourism and new challenges

Activity A.T1.1
Territorial Analysis on cross-border sustainable tourism development

INDEX

Introduction

Tourism competitiveness depends on the sustainable use of territorial assets: the differentiation of destinations depends on the integration of cultural and natural resources into the tourism supply, but also on their preservation over time. The purpose of this activity was to provide a comprehensive analysis of the importance of local resources – both cultural and natural – for regional tourism competitiveness. Each Partner addressed the development of one territorial study about sustainability practices and new challenges brought by modern tourism in its own region. Although these regions normally include more than one tourism destination, they are relevant in order to address policy questions related to environmental impacts on marine biodiversity in the South Adriatic Area. PPs collected all the resulting data to realise a digital and paper format publication to be further disseminated. The publication and its best practices can be potentially replicated elsewhere.

Territory Analysis - Municipality of Termoli, Italy

Context

Molise, the second least extensive region in Italy, is located along the Adriatic coast in southern Italy, covers 4460 km2 and has 302,265 inhabitants (2020). It is the smallest and the newest region in Italy, with 136 municipalities, of which 84 are in the province of Campobasso, the regional capital, and 52 in that of Isernia.
The territory of Molise is constituted for 55% by mountains and for the remaining 45% by hills. Within the territory rises the Apennines Campano with peaks that exceed 2000 m. Towards the east the mountainous territory thins out into hilly territory and only close to the Adriatic Sea, land descends into a flat strip of low and sandy coasts.
The population density of Molise is low, the most populated areas are those along the coast and the hills, while on the mountains the population is scarce. The territory rich in mountains, has made difficult the construction of communication routes and caused, compared to neighboring regions, a delay in industrialization and consequently a strong migration to other Italian regions. The economy of Molise consists of 5.4% agriculture, 14.1% industry in the strict sense and 54.6 the category of other services, 20.6% trade, tourism, information and communication.

Figure 1: The City of Campobasso

The employment rate in 2019 is 54.5%. The unemployment rate in 2019 averaged 12.2%.
The agricultural sector has about 34,000 companies and employs as many as 9,600 workers. Compared to other Italian regions in Molise a large number of people are engaged in the primary sector. Molise's entrepreneurial system is mainly composed of small businesses; at the end of 2019 there were 35,470 registered businesses in Molise. (Source: Chamber of Commerce of Molise, Molise in cifre _2020; Site Molise Region – Sector agricultural policies _2022)

Tourism Resources and Activities

According to a survey carried out by the Molise Region (Source: Chamber of Commerce of Molise, Molise destinations report _2020) the tourist resources of the Molise territory are wide and widespread. In fact, almost every municipality has its own particularity, a place of interest rich in tradition and history that identifies it. Here the sense of community is highly developed, with a wealth of historical and architectural villages, traditions, products and natural resources of great value.

Figure 2: View of the old town in Termoli

The mapping conducted (Source: Regional Strategic Plan for Tourism Development, Development Italy Molise _2019) has allowed to detect the presence of 226 events and festivals, characterized by continuity over time, covering most of the municipalities of Molise.
In the same way, 20 products have been surveyed, classified as traditional or protected by quality marks, which however represent only partially the local potentialities for the valorization of enogastronomy.
In Molise are countless the medieval villages where it is possible to admire towers, defensive walls, gates and manors.
Among these, the Castle of Gambatesa, in Civitacampomarano one of the most beautiful of the region, the Pignatelli Castle of Monteroduni, the Castle of Tufara, the Swabian Castle of Termoli overlooking the sea.
There are important places of faith such as the Benedictine Abbey of San Vincenzo al Volturno, one of the most important monasteries of antiquity, the Sanctuary of Addolorata with the Basilica of Maria Santissima Addolorata in Castelpetroso.

Figure 3: Typical inland village of Molise

Along the coast, there are many famous places that have been awarded the Orange Flags of the Italian Touring Club - Ferrazzano, Scapoli and Agnone - and the Blue Flags of the EU - Termoli, Petacciato and Campomarino - as well as the tratturi, the ancient communication routes, used by shepherds during the transhumance from the pre-Roman era until a couple of centuries ago.
This is the ancient tradition of seasonal migration of livestock from mountain pastures to those of the plains and vice versa. In 2019 it was included in the List of Intangible Cultural Heritage. Another Unesco heritage is the Biosphere Reserve Collemeluccio-Montedimezzo, located in the province of Isernia and includes two very large forests in a sub-mountainous area, with peaks over 1200 meters above sea level, included in 1977 in the MAB program with the aim of maintaining a balance, lasting over time, between man (Man) and his environment (Biosphere), through the conservation of biological diversity, the promotion of economic development and the preservation of cultural values.

Tourist destinations

The most important tourist destinations of the region are mainly located in two areas of the territory: Coast of Molise and Upper Molise. The territory of the Coast of Molise extends for about 36 km between the mouth of the channel of Formale del Molino, in the north (Abruzzo), and the mouth of the torrent Saccione, in the south (Puglia).

Figure 4: Trabocco of Termoli

The promontory of Termoli, the largest tourist resort on the Coast of Molise with its ancient fishing village and marina, divides the coast into two main areas the one to the north to the municipality of Marina di Montenero di Bisaccia, and to the south extends to the municipality of Campomarino.
The Coast of Molise, with its 260 square kilometers, is characterized by important natural qualities, a crystal clear sea, lush vegetation, the presence of areas not yet contaminated, and offers a set of quality tourist services: equipped beaches, bathing establishments, accommodation services, catering. In this part of the territory there is a wide diversification of food and wine, with the prevalence of products from vines and olive trees.
The coastline has beaches, generally sandy, which evolve inland in beautiful dunes characterized by the typical Adriatic coastal vegetation, followed by alluvial plains, fertile land and finally by hilly formations. The presence of dune environments and Mediterranean scrub, scarcely anthropized, in this area of the Adriatic region has a great naturalistic importance.
The activities linked to the sea are an important

resource of the Molise territory because of its attractive characteristics and the fishing tourism and the ichthyic tourism have been identified by the regional administration as an important opportunity for the valorisation of structures, boats and villages where fishermen live and work.

Figure 5: Turistic Port of Termoli

The other tourist destination of the region has been identified in the area of Upper Molise, a territory of 348 square kilometres, with mountains and uncontaminated woods, which extend from the urban area of Isernia to the border with the provinces of Chieti and L'Aquila, constituting a unique place for its villages rich in history, splendid monuments, sanctuaries, natural landscapes and mountain paths.
Upper Molise is characterized by the excellence of its enogastronomical productions such as wines, dairy products and cold cuts.

Receptivity

In 2019 (Source: Chamber of Commerce of Molise, Molise destinations report, swot analysis _2020) the number of hotel and non-hotel accommodations in the Coast of Molise is 171, while there are 47 in Upper Molise. Throughout the region there are 554, of which only 101 are hotel facilities. In the same year the region hosted a total of over 439 thousand presences between residents and non-residents, but the foreign component represents only 7.9%.
In Upper Molise, tourist pressure
(average daily number of tourists per 100 inhabitants) stood at 0.3%, while along the coast it is 1.2%. The territorial distribution of hospitality is very differentiated: the coast has a high density of accommodation, recording 29 beds per square kilometre and Termoli represents the tourist center of gravity, while Upper Molise has a very low index, equal to 2 beds per square kilometre.
In the destinations considered, the availability of supply is underutilized with the lowest gross utilization of accommodation facilities in Upper Molise, equal to only 5.9.

Figure 6: Typical products

Weaknesses and strengths of the tourism system

Weaknesses

According to a recent survey (Source: Regional Strategic Plan for Tourism Development, Development Italy Molise _2019) promoted by the Regional Administration, various critical points emerge in the area of tourism supply.
Among these, the most significant relate to infrastructure and accessibility of the areas, services related to accommodation, reception capacity and supply of related services, tourism products, promotion, governance of the sector and networking capacity of operators in the sector.
As far as mobility linked to tourism is concerned, there is a lack of efficient connection infrastructures. Molise does not have its own airport: the closest one is Pescara airport in Abruzzo, 171 km away from the capital Campobasso. There are no direct trains from Northern Italy, the railway system is inadequate.
Once in Molise, the same internal connections are insufficient to guarantee coverage of the territory by public transport and many villages can only be reached by private transport. Roads are often under maintenance and even a technological infrastructure such as broadband is unable to cover the entire territory.

Figure 7: Source - Molise Chamber of Commerce

In the field of accommodation and hospitality there is an undersized and unsustainable reception facilities, often family-run. The presence of tourists is only seasonal and often the centralization of their data on arrivals and departures is inefficient. In the area there is a lack of specialized guides and services to support and accompany tourists. In addition, the lack of integrated packages and tools to build tourist loyalty is accompanied by the absence of those services that can facilitate the stay of tourists and push them towards other offers related to the use of the Molise territory.
A weakness in the local entrepreneurial fabric has been identified, including that of young people, as well as a lack of capacity for innovation with respect to the competitive assets of the market.
Generally, tourism promotion is very poor, fragmented and inadequate in terms of promotion on the web, accommodation facilities are not familiar with activities in the area and do not promote them; there is no promotional material available to accommodation facilities (the issue of quality, quantity and availability of promotional material) and there is still insufficient knowledge of the area on the part of residents, which has a negative impact on "consumer to consumer" promotion.
In addition, citizens are not active in projects and services for the care and enhancement of the area.
Along the Coast of Molise the percentage of use of available beds is low, to be increased compared to the potential of the offer of tourism products.
The destination is not present in social platforms.
There is a lack of specific services for food and wine experiences (ex. schools, open oil mills and wineries, routes and roads), cultural resources should be enhanced by connecting them with opportunities for tourism experiences through dedicated services (Source: Chamber of Commerce of Molise, Molise destinations report, swot analysis _2020).
The tourist product of Molise more mature and developed is the beach that should be connected with proposals for different vacation experiences such as cultural, naturalistic, sports. As for the specificity of the Upper Molise area, there is no international tourism.
It is necessary to plan the

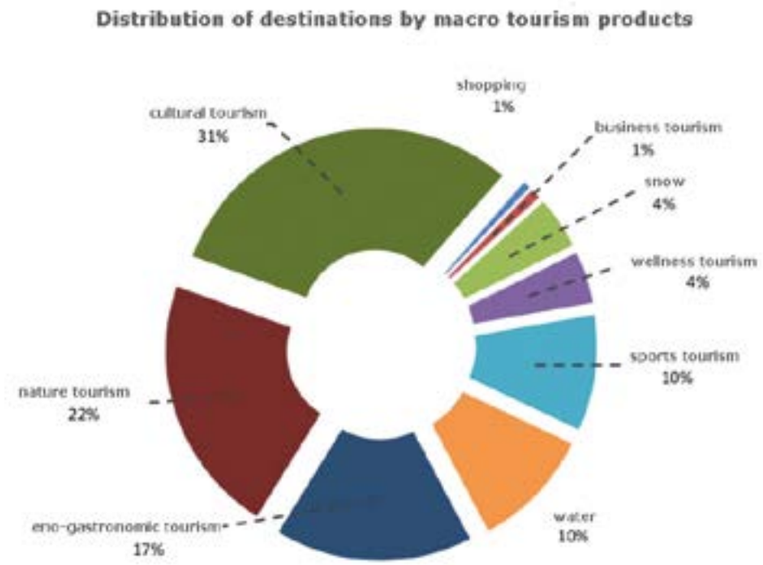

Figure 8: Source - Molise Chamber of Commerce

development of tourism aimed at positioning the cultural, enogastronomic and naturalistic resources that are present in the area. The places of Upper Molise are difficult to reach, the lack of connecting infrastructure must be overcome.
The sports, cultural and naturalistic offer should be further developed in order to allow it to go from a potential product to a real tourist product. Tan-

Figure 9: Fontana Fraterna, City of Isernia

gible and intangible cultural resources should be enhanced by connecting them to opportunities for tourist experiences with innovative services.

Strengths

As far as the strengths of the area are concerned, both the capacity for experiential hospitality and the significant heritage and strength of identity of the region emerge.
There are, in fact, potentialities linked to the receptivity of the territory, such as those concerning the presence of private real estate in disuse, which could be available to increase the supply of tourist accommodation.
Based on experiences already underway in Termoli, the experiments of the “widespread hospitality” and of “family hospitality” are interesting, as they are integral parts of the “Molise Method” already tested and successfully received by visitors. In particular, on the Coast of Molise there is a good presence of national tourism, the accommodation capacity is well developed even if mainly concentrated in Termoli, there is an adequate supply of travel agencies.
The coast maintains excellent potentialities in terms of tourist products, in particular enogastronomy, with the presence of many DOP and IGP products and with a specialization in ichthyic tourism thanks to the presence of specialized companies. Seaside tourism appears to be a consolidated product.

It also has attractive opportunities in terms of naturalistic tourism. Therefore, there appear to be ample margins for the exploitation of the tourism potential of these destinations, endowed with an overall good physical accessibility but not with an equally widespread and capillary digital accessibility due to a relatively contained use of the main online communication channels.
Upper Molise instead is a destination oriented by the offer of tourist products mainly focused on enogastronomy - even though with an almost total absence of services supporting local productions - and by a partial offer of a vacation connected to the presence of a widespread cultural and naturalistic heritage.
The tourism potential could grow, by expanding and improving the infrastructure supporting tourist activities and, on the other hand, the services which are a corollary to the main products offered (places where to showcase and provide an adequate cultural context to typical productions, high

Figure 10: Cerro al Volturno, Medioeval Village

level catering and cooking schools) or even events which draw the attention of a wider audience than the one currently involved.
There is a greater share of small extra-hotel accommodation capacity which is quite interesting in attracting niches of tourism, including international tourism interested in eco-sustainable vacations and seeking vacation experiences in contact with local communities. The lack of a freeway network can be a competitive advantage in proposing itself to a resilient market interested in sustainable vacations.

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New challenges of the territory for sustainable tourism

In addition to the priorities identified by the Molise region for the development of tourism, oriented towards the differentiation and identification of innovative tourism products, the seasonal adjustment with the identification of new targets, the increase in the quality of the offer thanks to the training of operators, the creation of networks between local stakeholders, is added the centrality of a tourism aimed at sustainability.

Figure 11: Outdoor sport

The impact of tourism on the territories can have both negative and positive effects, and it is necessary to be able to combine the economic benefits that can determine the increase in tourism offer with the protection of natural capital present in the territory.

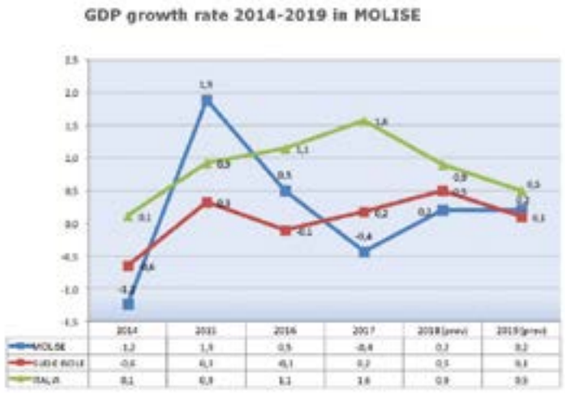

Figure 12: Source: Regional Strategic Plan for tourism

In fact, tourism is an increasing source of pressure on natural resources and the environment but also an opportunity for economic development. It is a matter of orienting tourism towards new principles, directing the choices of users in a different way, capable of creating less impact, increasing environmental awareness and enhancing local culture, making the whole community responsible for the management of tourists.
The poor exploitation of regional resources is a trait common to all regions of Southern Italy, as shown by Bank of Italy data (Source: Regional Strategic Plan for Tourism Development, Development Italy Molise _2019).
In this context, the data for Molise are particularly negative and the regional destinations present a medium-low level of maturity on the demand side, attesting Molise often to the last places in the analysis of tourist flows in Italy, and - on the supply side - the region has important potential for growth both in geographical terms (e.g. kilometers of coastline and trails to be enhanced) and in terms of services offered. This concerns first and foremost the tourist destinations par excellence, sea and mountains, but also other leading national - and regional - resources, such as culture and food and wine.

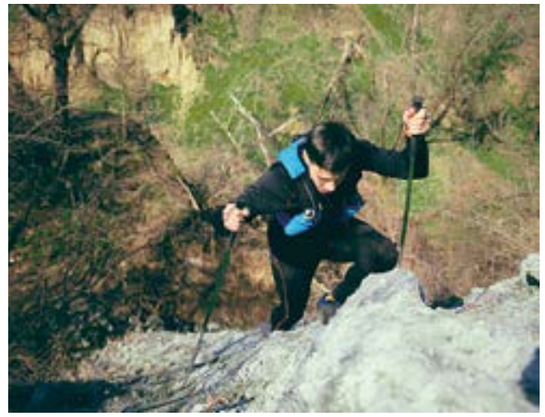

Figure13: Oudoor sport

This criticality, as the Bank of Italy points out with regard to Southern Italy, is an opportunity where “spaces emerge to be exploited in order to take full advantage of the sector’s potential, [...] where tourism activities still appear relatively undersized and where, given the area’s delayed development, the benefits in terms of impact on product and employment could be greater”. Furthermore, in

a phase of profound transformation of the tourist demand and, more generally, of the competitive assets of the Italian regions, the delay in Molise opens up prospects of great interest insofar as unconsolidated supply chains are capable, if opportunely promoted, with greater flexibility and lower conversion costs, of accepting new instruments and new directions of development with a high content of technological innovation.
A third element to consider is the possibility, for a region in a still immature phase of its tourism development, of building a model of sustainable growth that avoids the negative externalities that many mature destinations are experiencing, first and foremost the increase in the cost of living for residents, the increase in the real estate value of homes and overcrowding.

Figure 14: The Natural Capital of Molise

Last but not least, Molise has good feedback in the evaluation of the visit experience. Having defined a strategy for overcoming access problems, the central theme therefore appears to be that of valorizing Molise's resources which, as has been amply described, are significant and perfectly in line with the evolution of tourism demand. "Valorization" is therefore a strategic process for the purposes of building the "product-promotion", strengthening the experience of the visit in terms of quality and prolongation of the stay, the loyalty of the tourist functional to the return and its transformation into a promoter of the territory in its countries of origin. Closely linked to the theme of valorization is that of innovation. As already pointed out, innovation is the fundamental strategic axis both for building products that intercept tourist flows that look to ever new and tailor-made offers, adaptable and modulable - "in transformation" - and for identifying new languages and promotional tools, more widespread and able to intercept differentiated audiences, and, finally, for making tourism strategies an opportunity to relaunch the territory with a view to sustainable development and intelligent specialization.

Monitoring changes

At a time when strategies are being set up to steer tourism more and more towards sustainability, it is necessary to have an adequate monitoring tool, the main objectives of which are to
- continuously measure the achievement of the expected objectives from a social, environmental and economic point of view;
- have reliable data regarding natural capital and biodiversity;
- enable informed reflection within the community and with the participation of all stakeholders.
The EU has defined several indicator systems that measure its dimensions.
However, they do not yet seem to allow for reliable comparisons over time and space on key aspects such as nature, conservation, culture, benefits to residents, education.
Among the most relevant initiatives to measure sustainable tourism on a global level is the list of indicators formulated by the UNWTO (2007) at the Sustainable tourism indicators and destination management Workshop.
In Europe, reference is made to 2 main systems. In 2013, the European Tourism Indicator System (ETIS) was introduced to support tourism destinations in monitoring and measuring their sustainable tourism performance based on a common comparable approach. The ETIS toolkit includes a set of core indicators (43) focused on crucial areas for sustainability management (destination management; economic value; social and cultural impact; environmental impact) and a set of supplementary indicators (maritime tourism; tourism accessibility; transnational cultural routes).
The second system is the Tourism and Environment Reporting Mechanism (TOUERM), developed by the European Environment Agency, which is updated to measure both environmental impacts (minimum and maximum) and sustainability trends at the European scale.

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How to respond to these challenges: 3 scenarios of sustainable tourism

Responding to the challenge of increasingly orienting tourism in Molise towards sustainability means first of all taking into account the current and future economic, social and environmental effects, responding to the needs of visitors, the sector, the environment and local communities, knowing, for example, that it is necessary to reduce the overall ecological footprint of this sector, especially through multimodal transport and policies to protect and increase the natural heritage and biodiversity, respecting the socio-cultural authenticity of the host communities, ensuring sustainability and bringing socio-economic benefits to all stakeholders.
In this sense, in a territory like Molise, the first step is to transform the main resources into innovative products, increasing their capacity and value. The top destinations, sea and mountains, can be represented in a stage of semi-maturity, that is not yet completely "saturated" neither from the point of view of supply nor from the point of view of demand.

Figure 15: Castel San Vincenzo Lake

The possible evolutionary axes, deduced from the international economic picture described above, but to be verified once activated a regional information system capable of returning an adequate X-ray of the flows, even in relation to similar destinations in other regions, are:
- Expansion on the coast of offers aimed at specific targets, e.g. demand for nature tourism;
- Increase/enhancement of additional services, e.g. fishing, water sports;
- Increase/enhancement of related supply chains, e.g. food and wine;
- Creation of composite sea/culture/mountain packages.
On the basis of these axes, in the context of and with the experience gained through the BIOTOURS project, three main development scenarios are possible.

Scenario 1 - Biodiversity, natural wealth, environmental awareness

This type of scenario is the one that aims at the valorization of some fundamental peculiarities and excellences of Molise: biodiversity, natural and ecological wealth and availability of zero km products. The "unknown" Molise becomes an OASIS that, once reached and discovered, offers, through its strengths and specificity, an exclusive and personalized experience.

Figure 16: Dolphin & Whale watching activities

Through the fruition of uncontaminated naturalistic spaces and by leveraging the culinary peculiarities, the visit to Molise guarantees beneficial effects on well-being and health. In this way it is possible to protect the nature and the green vocation of the territory, as well as to stimulate virtuous paths of growth that guarantee significant effects especially in environmental and occupational terms.
Environment, health, biodiversity and culinary excellence are some of the issues on which to build and define an integrated offer of goods and services. In this type of scenario, the objective is to involve different supply chains around a single brand/objective:
- Universities and/or start-ups are working on a project to catalogue/identify the biodiversity of

Molise;
- accommodation facilities are key players that, for example, relaunch and propose experiences and experiential routes, with targeted interventions in which tourists can play an active role (planting trees, returning to old crops, etc.);
- restaurants offer targeted tasting packages that offer unique experiences;
- agriculture recovers old crops or foods/vegetables.

The action aims to increase the attractiveness of tourism, to encourage the development and rediscovery of supply chains, to create new opportunities for employability, to achieve quality certifications for the area also in view of a strong reduction of CO2 production and reduction of the overall ecological footprint, to promote investment in fully sustainable and green accommodation.
Also this action will be strongly focused on the concept of health-care-individual well-being, increasingly felt after the outbreak of the pandemic Covid 19, and is linked on caring the social community also as a biological eco-system. In this context fits the initiative promoted by the City of Termoli and developed within the INTERREG BIOTOURS project to start an experimental initiative in order to:
a. elaborate an operational project for the constitution of a research and training pole on cetacean sighting;
b. create the conditions to give concrete application to what is foreseen by the operational project;
c. start pilot actions for the observation and research on cetaceans;
d. encourage the presence of students and researchers at research facilities;
e. lay the groundwork for the establishment of a scientific-tourist chain that favors the birth of opportunities for social, economic and environmental development of the territory of Termoli;
f. promote citizen science initiatives (a term that means all those activities carried out by people who are not necessarily linked to the scientific world in research activities).

Scenario 2 - Sustainable seaside Molise

Wild and natural coastline but also equipped beaches where you can comfortably relax, sea lovers in Molise can find 35 km of coastline with much to offer.

Figure 17: See and Beach Activities

The beach of Termoli, with the fishing village and the Swabian Castle that overlook the beach from the promontory and its overflow, just below the city walls, is also ideal for those who want to go sailing or practice water sports (surfing, windsurfing, sup and kitesurfing especially in RioVivo, where it is said that there are the best waves in the whole Adriatic); that of Petacciato, characterized by dunes, pine forest and crystal clear water, and Campomarino Lido, Blue Flag 2020, with its recently built marina and its beaches are surrounded by pine forests, Marina di Montenero di Bisaccia, in the extreme north of the region.

Figure 18: Activities in the wilderness of Molise

Those looking for tranquility, away from other bathers, without giving up the chance to experience a unique day, can always opt for a boat trip. Finally, the lake of Castel San Vincenzo is the perfect location for those who want an unusual bathing experience, without necessarily going to the coast.
In this scenario, the main objective is to integrate the typical bathing offer with proposals that are able to capture the needs of tourists to have a more complete and integrated experience.

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The supply chain linked to the discovery of biodiversity and the natural capital of Molise could be the one that is most suitable for creating an integrated experiential package.

Figure 19: Molise Intangible Cultural Heritage of Humanity by UNESCO

Scenario 3 - Molise UNESCO

The cultural heritage of a territory is also composed of all that living culture transmitted by our ancestors, such as traditions, oral expressions, arts, rituals, festive events.
What may seem to be simple strips of grass are in fact the tratturi, the ancient roads, traveled from pre-Roman times until a couple of centuries ago, by shepherds during transhumance. Transhumance is in fact the ancient tradition of seasonal migration of livestock from mountain pastures to those of the plains and vice versa.
In 2019 this practice was declared Intangible Cultural Heritage of Humanity by UNESCO. Today it is possible to travel these silent “roads”, which often coincide with the route of the CAI Trail, on foot, by bicycle or on horseback and join the herdsmen who still carry on the work of the dairyman and transhumant shepherd, to live this symbiotic experience between man, animal and territory.
In Molise there are also two linguistic minorities well traceable.
The first one is the Croatian one which was formed by settling in the territory between the rivers Biferno and Trigno, in particular in the municipalities of Acquaviva, Montemitro, San Felice del Molise, where the Slavic community over the centuries has maintained its traditions and its idiom, the stocavo, and it is still possible to find signs written in two languages.
The second one is the Albanian one, or arbëreshë, a population of Albanian ethnicity and language coming from Albania since the 15th century and located in Molise within the borders of the province of Campobasso, along the Biferno Valley: Campomarino, Montecilfone, Portocannone and Ururi.
There are many traditional events in Molise, religious and otherwise, in which you can participate during the course of the year.
From summer events such as the Pezzata in Capracotta, (festival of barbecued lamb and boiled sheep) in which the link with pastoral traditions is revived, to the Festa del grano in Jelsi, dedicated to Sant’Anna, one of the most important folkloric traditions, in which floats made from ears of corn, true works of art, parade.
And always in Jelsi, the structure dedicated to the culture and tradition of these wheat floats, or the International Festival of the Reed-pipe of Scapoli,

Figure 20: Molise beaches and seaside landscape

an important occasion of sharing and fun (in the village there is also the Museum of the Reed-pipe).
Among the religious events, not to be missed is the Procession of Mysteries in Campobasso, on the day of the Corpus Domini festivities, a unique procession in which angels, devils, madonnas and saints, suspended in the air, parade through the streets of the city.
The “ingegni” or the installations made by Paolo Saverio di Zinno in the mid 18th century, when they are not paraded in the procession, can be admired in the Museum of Mysteries of Campobasso.
Then the procession of fishing boats in the waters of Termoli that carry the statue of San Basso in procession at sea and then return it to the port and

take it back to the cathedral, in Larino, for the Procession of San Pardo parade 130 triumphal carts pulled by oxen decorated with a multitude of colorful flowers.

During the Christmas festivities not to be missed are a stop in Oratino, where a large candle of over 13 meters is set on fire to await and evoke the arrival of the Sun and especially the Ndocciata of Agnone, a Christmas tradition associated with fire.

The ancient crafts, the old stores or the great artisan tradition, this is also a way to discover Molise. With a journey that begins at the Pontificia Fonderia di Campane Marinelli, in Agnone, the oldest foundry in Italy to which the "Giovanni Paolo II" Historical Bell Museum is attached, to learn about the techniques of working and forging bronze and continues with a visit to Frosolone, a center of excellence for the craftsmanship of knives. Another form of craftsmanship that comes from afar is the one linked to the working of stone in Pescopennataro, where a real artistic school was established in 1700 and is still carried on today by skilled stonemasons.

If you want to know everything about the world of perfumery, on the other hand, a stop in Sant'Elena Sannita is a must, where the Museo del Profumo is located, which is also an authentic laboratory with a botanical garden with plants useful for experimenting with essences. And for those who love music? A visit to the village of Fontecostanza, near Scapoli, where skilled artisans still create bagpipes and ciaramelle ("pifferi") in their historic stores. And finally, a visit to one of the ancient sweet shops of Agnone where authentic curly sugared almonds, a true Molise specialty, are still made.

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Territory Analysis - Jonian Dolphin Conservation (JDC), Taranto, Italy

Context

According to regional data from the Tourism Observatory, since 1998 the region of Apulia has recorded a steady increase in the movement of tourists, distinguishing itself in terms of growth over the years both in Italy and in the North-Mediterranean countries. Among the reasons for this notoriety is the offer of different attractions, including the Apulian coastline with its natural beauty combined with a solid cultural-historical and food-and-wine offer. Since 2011, there has been a notable increase in arrivals and presences (+18% compared to 2010), so much so that in August of that year, Apulia was the leading destination among Italian regions in terms of incoming tourism (it hosted 10.9% of the entire mass of trips to Italy).

These data, again analysed by the regional observatory, show that tourism in Apulia in 2011 was predominantly domestic, with a 22% intra-regional flow followed by tourists from Campania and Lazio. Over the same period, the flow of visitors from abroad represents a small share of demand in Puglia, accounting for 16% of total arrivals and presences.In the three-year period 2009-2011, only four Apulian provinces recorded increases (Lecce, Bari, BAT and Brindisi) while the province of Taranto recorded negative data with a loss in both arrivals and presences. Another key fact is that, again during the three-year period 2009-2011, tourism was highly seasonal, with a strong concentration of Italian tourists in the summer period, while a greater propensity of foreigners to choose months such as April, May, September and October is evident.

Moving on to 2014 and analysing the data provided by the regional observatory concerning tourist flows in Apulia, we note a further increase in the foreign component, followed by an increase also in the domestic flow, with the presence of 65,000 in the city of Taranto.

The growth of incoming to Apulia is most noticeable in 2019 with an increase of 23% compared to 2015. The greater presence of foreigners is attributable to an increase in flows from France, the USA, the Netherlands and Russia. In the same period, of the regional total, the province of Taranto recorded 7.7% of arrivals.

It is intuitive that all this data concerning the increase in tourist numbers contributes to increasing Apulia's GDP.

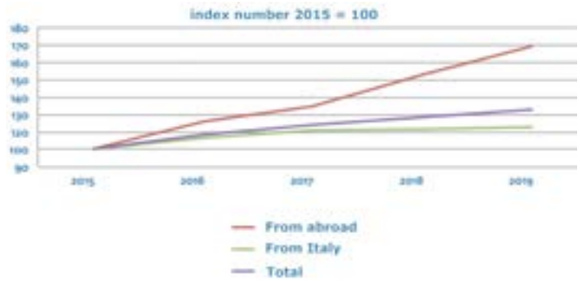

Figure 2: Trend 2019 -trend of arrivals in Apulia

Further indicators:

• tourism in Apulia has an impact of 6.5 billion on final consumption (12.3% of total consumption)

• 9 billion in terms of added value (13.6 % of the total)

• 135,000 employees (15.4 per cent of the total) directly and indirectly involved in the tourism chain formed by 58,000 enterprises (38 per cent of the regional total) - (Apulia Regional Observatory 'Report2020' data)

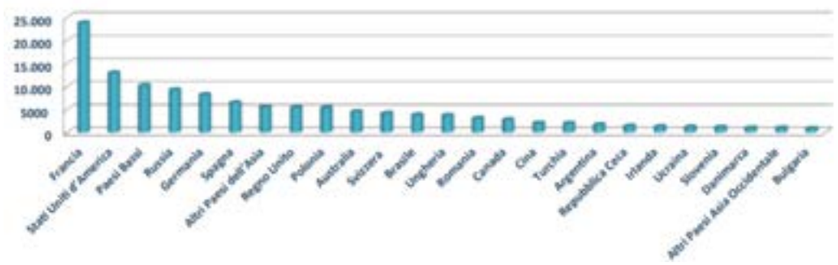

Figure 1: International tourism - Change in arrivals from abroad from 2018 to 2019

Having partly analysed the data on tourist flows in Apulia, it is easy to understand that this is an area whose greatest attraction is the sea and natural resources. With this in mind, and

again trying to steer the economy of Taranto in a different direction, the concept of ecotourism and the development of activities that are part of the protection of environmental and naturalistic resources is included.

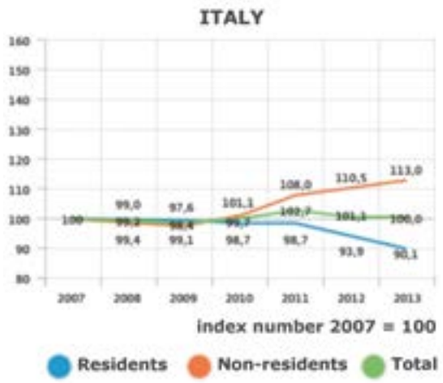

Figure 3: Customer attendance in Italy and Apulia

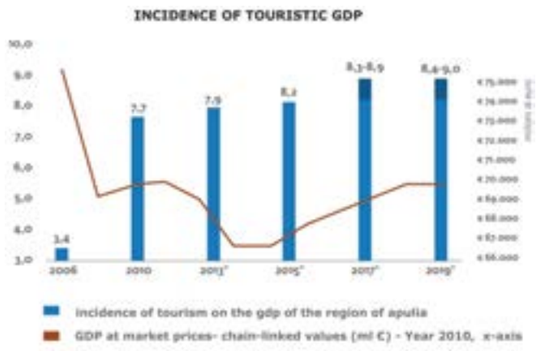

Figure 4: Incidence of Touristic GDP

Ecotourism

According to the International Ecotourism Society, ecotourism is characterised by a number of important aspects: it is aimed at promoting sustainable development of the tourism sector; it does not lead to the degradation or depletion of resources; it promotes and protects respect for the environment; it enhances natural resources by responding to a more biocentric than anthropocentric philosophy; it is based on a direct encounter with the environment and is inspired by a direct cognitive dimension.

Adherence to these general lines produces positive results: environmental and socio-cultural compatibility; benefits for environmental protection projects and the local population with participation, creation and wide distribution of income; an increase in environmental awareness and greater acceptance of nature conservation as a profitable and appropriate land use, both among tourists and other stakeholders in local development.

For the Associazione Ecoturismo Italia, the Italian contact point of the International Ecotourism Society, ecotourism in the future should be “a way of travelling responsibly in natural areas, conserving the environment in which the local host community is directly involved in its development and management, where most of the benefits remain with the community itself”.

Figure 5: Ecotourism

With this in mind, it can be understood how nature-based tourism represents a tool for economic and employment development and at the same time also acts to improve the quality of life by making virtuous use of the natural capital of an area.

Delving further into the subject, we arrive at the blue economy, or blue economy, which derives from the green economy but, while the latter envisages a business model based on a lower environmental impact with a definite reduction in CO_2 emissions, the blue economy tends to want to eliminate them altogether.

This economic model does not require companies to invest more to save the planet, but aims to produce zero hazardous waste and create more profit, using less capital investment.

The blue economy encompasses all economic activities that have a connection with the sea, the coast and the seabed and proposes new solutions for ocean-related activities: fishing, aquaculture, the food processing industry, shipbuilding and services related to yachting, coastal tourism and mining.

As a result of this particular focus on nature tourism in the mid-1990s, the definition of Citizen Science was coined, which literally means ‘citizen science’ and tends to indicate the involvement and active participation of citizens (students, simple enthusiasts, people not involved in academic activities) in scientific research.

Over time, this new concept was also recognised at an academic level with the following definition: ‘collection and analysis of data related to the natural world by a public taking part in a collaborative project with professional scientists’.

In Citizen Science activities, the involvement of school students of all levels is essential as they are particularly well placed to understand and take on board the concepts of environmental protection and respect for biodiversity.

Another aspect not to be underestimated in the development of Citizen Science is a new evolution in the field of tourism, as the concept of mass tourism is being abandoned to leave more and more room for experiential tourism, where what counts is not the destination but the experience, which must be lived in an intimate and personal manner.

An increasingly important role within this type of tourism is played by whale watching and dolphin watching, i.e., the observation of whales and dolphins in their natural environment. These activities represent a rapidly growing business worldwide and millions of people a year participate in tours to see these magnificent and charismatic animals in their habitat. Whale & dolphin watching activities not only allow observers to enjoy the marvellous spectacle in the open sea and the opportunity to learn about them, but also provide the development of local tourism infrastructure and a valuable livelihood for coastal communities.

The rapid increase in the number of dolphin and whale watching organisations, however, may have a negative impact on the natural behaviour of cetaceans and may influence their migration patterns. Therefore, responsible and sustainable dolphin and whale watching initiatives are crucial to make this activity a long-term form of marine tourism activity.

Case Study - Taranto

This analysis report focuses on the city on the Ionian coast of Apulia, Taranto, and the gulf whose name derives from this city, the Gulf of Taranto.

There are two reasons for this:

1) is a city that has suffered and, to some extent, still suffers from a bad reputation due to the pollution of the area caused by major industrial poles and where, new forms of tourism are the cornerstone of the change in the vision of both the citizens of Taranto towards tourists and tourists towards the city itself;

2) is home to the best practice Jonian Dolphin Conservation, the subject of this research.

We must begin our focus on an important concept. It is utopian to think of bringing to an area fragile in terms of natural and cultural heritage, a substantial tourist development and an increasing number of visitors in a short space of time. Not only that. Besides being utopian, it is also potentially harmful.

The negative impact of tourism, and in particular over-tourism, on the physical and natural environment has been extensively studied in recent decades.

Figure 6: City of Taranto

The damage of tourism to the natural environment is caused not only by the large number of visitors, but also by the inappropriate behaviour of visitors.

Improper attitudes adopted by tourists create and have created temporary or permanent damage to the delicate balance of ecosystems and affect elements of the natural environment such as flora, fauna, habitats and landscapes.
The main cause of such tourist behaviour, which can pose a danger to the ecosystem, is the lack of attention and knowledge of visitors. This has often led to unfavourable attitudes of residents towards tourism, resulting in friction and tension between hosts and guests and problems of social sustainability. The most effective tools to address these problems and prevent their negative consequences are environmental monitoring, education and teaching, to show visitors how to behave respectfully. Fortunately, there is now a high level of attention to the sustainability of visitor flows and the impacts of tourism on the natural environment, biodiversity and the preservation of ecosystems. Tourism is recognised as an industry that can help support environmentally friendly initiatives, raising awareness about the value of natural resources and the importance of their conservation, and at the same time generate jobs.
The city of Taranto, in the past, was and, to some extent, still is, considered a place affected by heavy pollution and deterioration of environmental resources that reflects negatively on its urban image. For this reason, it is necessary to invest heavily, intelligently and far-sightedly in the renewal of its image through an effective territorial marketing plan, to increase the local community's awareness of environmental sustainability and to foster the conservation of natural resources and biodiversity, as a resource on which to focus for the development of the city and new generations.

Case Study - Jonian Dolphin Conservation (JDC)

Jonian Dolphin Conservation (JDC), an association based in Taranto, has been researching and protecting the sea and cetaceans in the Gulf of Taranto since 2009.
It represents an entrepreneurial blue economy and a sustainable way to use marine resources. Deep connoisseurs of the marine environment in its most diverse aspects, the members of the JDC team put their experience and aptitudes at the disposal of research in the deepest sense of the term. They specialise in marine project management with a focus on environmental impact studies and lead an innovative programme dedicated to the study of marine mammals.

Figure 7: Activities of Jonian Dolphin Conservation (JDC)

All research activities are carried out in close collaboration with the UNIBA Department of Biology, with which they have been collaborating since 2009 through a phase of data collection using standardised methodology on the distribution of cetaceans in the Gulf of Taranto, which has been followed by dozens of scientific publications in sector journals and at national and international conferences.

Figure 8: Dolphin-watching

That is not all. In recent years, new emerging and current lines of research have also been prepared in collaboration with other national and international institutions (e.g. the Institute of Intelligent Systems for Automation - National Research Council - CNR ISSIA and the Italian Navy) that are contributing and will contribute to condensing a critical mass of studies and a network of interest focused on the need to conserve cetaceans, an important component of Mediterranean biological diversity.
The ways in which the Jonian Dolphin Conservation team engages students, tourists and citizens are manifold and come to life through various Citizen Science projects.
Not only daily dolphin-watching, whose programme is called Researcher for a day, is the backbone of the association's activities, both financially, in terms of the amount of scientific data collected and the number of people involved.

Over the years, a variety of project activities have been carried out that still involve a very large number of users today:
• Marine Biology Camps - international cetacean research and study camps open to students and enthusiasts from all over the world and organised on an ad hoc basis for educational institutions;
• JDC Expeditions - Marine Biology Camps are week-long research camps held from April to November in order to increase the number of research days at sea by pursuing specific, highly specialised research activities in each week;
• Pelagic Trip: day trips with the aim of monitoring the pelagic avifauna of the Ionian Sea;
• Taranto Port Days: a stage of the Italian Port Days initiative launched by Assoporti, the Association of Italian Ports, in synergy with Jonian Dolphin Conservation in order to promote, through the slogan "opening port life and culture to people", a joint and coordinated promotion activity of port life and sea culture, including cultural, musical and sports events.

Figure 9: the Ketos Centre

Parallel to these activities, the JDC team often organises and collaborates in seminar, cultural and social events involving tourists, local and non-local schools, private and public organisations aiming at the social integration of disabled and economically disadvantaged people.
Lastly, the JDC also supports recreational activities organised in the city of Taranto, in order to allow tourist interaction with the sea resource to the widest possible public. One of these activities is Cantine in Barca, an initiative part of the Due Mari Wine Fest that aims to disseminate and taste typical local wine and dairy products in a different setting than usual, that of boating.

Figure 10: promotion of the sea and cetaceans through the Ketos Centre

From 2019, the heart of the association's scientific research and dissemination activities is Ketos - Centro Euromediterraneo del mare e dei cetacei.
Created thanks to the support of "Fondazione con il Sud" through the call for proposals "Historical, artistic and cultural", the Ketos Centre covers an area of approximately 600 m² and is located inside Palazzo Amati, one of the most prestigious 18th century buildings overlooking the sea in Taranto. Ketos is the Euro-Mediterranean Citizen Science Centre that deals with the promotion of the sea and cetaceans through training, educational, scientific research and environmental communication activities.

Jonian Dolphin Conservation took care of the restoration of the ground-floor building, its re-functioning, and currently manages the facility, ensuring its full use by the wider public.
Ketos, equipped with state-of-the-art scientific-technological equipment, a research laboratory, a training room and eight PC workstations with Oculus VR visors, is unique in the national context in that it enhances the unique experience, now decades old, of Jonian Dolphin Conservation. At the

same time, it represents a cultural container aimed at fostering the development of knowledge and the valorisation of the area's resources.
Ketos is a garrison of good practices, a reference point for the blue economy and a symbol of regeneration in the context of the old city of Taranto. Ketos is revolutionary in the innovative scope of its offer: from didactic-museum services of a scientific nature to the possibility of using services linked to innovative ways of using content through advanced technologies, to consultancy in the areas of scientific research on cetaceans.
In addition, it offers the possibility of hosting contemporary artistic research experiences, of welcoming important initiatives or those with social aims aimed at the neighbourhood, and, acting as a true incubator, it promotes all activities aimed at enhancing the material and immaterial cultural heritage linked to the sea, the old town and local traditions. At the same time, it looks to the international dimension and encourages networking and the development of projects with relevant European stakeholders.
Approximately 12,000 to 14,000 people are involved in the association's activities each year, with 35 to 40 per cent from abroad. The association aims to raise funds for its research activities and increase visitors' awareness of environmental sustainability by shaping and providing exceptional visitor experiences.
The encounter with cetaceans is a stimulating and exciting moment for visitors. These charismatic animals are much loved and those who see them tend to share their experience through social networks by posting photos and videos, thus increasing general involvement and promoting the excursion and the place where it takes place. Reviews on the official website, which refer to the Tripadvisor rating, suggest that guest satisfaction levels are very high.
Nowadays, people are looking for unique and unforgettable emotions and experiences. Experience is often a tool for transformation and inner change, a way to achieve moments of intense satisfaction. Optimal experiences refer to moments of joy that occur when the experience allows one to achieve something unexpected, beyond expectations, needs and desires and that is, even, unimaginable before the experience itself. This is realised with the observation of cetaceans, an event that stimulates emotions and feelings of amazement.
Environmental education can benefit from this continuous search for memorable experiences, thus creating more useful and engaging learning and communication tools, essential for increasing community awareness of environmental issues and biodiversity conservation.
This is particularly true in fragile and already seriously threatened environments, such as the Gulf of Taranto, which require special attention and the involvement of all stakeholders.
The experiences offered by the JDC are unique, highly engaging and exciting. They have a substantial impact on participants, causing significant inner changes, new attitudes and increased environmental awareness.

TARANTO
CAPITALE DI MARE

Figure 11: Taranto Capital of the Sea' brand

In this sense, JDC's activities contribute to the achievement of multiple objectives, including entertaining, educating, raising awareness, promoting the city's image and fostering tourist development, creating a real economic inducement for the city of Taranto, as tourists participating in
JDC's dolphin watching activities also use other tourist-receptive services in the city such as hotels/b&b and restaurants, exhibitions, museums, etc.
A concrete example of this is the 'Taranto Capital of the Sea' brand that was created to share information, memories, stories and excellences of the area and become a source of information on local development opportunities. It represents an attempt to systemise the tourist and accommodation offer introduced by the sector's operators active in the Taranto area and, not by chance, the 'T' in the logo

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represents the tail of a cetacean, underlining the importance of the JDC's contribution to territorial marketing in terms of tourism and culture in the city of Taranto. Environmental education can benefit from the continuous search for such experiences by consumers and tourists, thus creating more useful and engaging learning and communication tools. These tools are essential for increasing community awareness of environmental issues and biodiversity conservation. The success of this project has initiated a change in mentality and attitudes that is bringing significant results in terms of tourism return for Taranto and a change in the mentality of Taranto residents and tourists towards the city. The involvement of stakeholders in sustainable development projects and the exchange of knowledge is a challenge for researchers, practitioners and policy-makers to establish evaluation parameters in the allocation of space assets and financial resources. Among the evaluation parameters, the exchange of knowledge and experience in open and collaborative spaces should indeed be a primary objective to ensure that best practices and solutions play a leading and inspiring role within the target ecosystem. Recently, the local municipality, the JDC, the University of Bari and several research institutions have supported the project to nominate the Gulf of Taranto as a Blue Oasis, a key step towards the establishment of a Cetacean Sanctuary, in other words, an area where the protection of cetaceans is enhanced and, to some extent, guaranteed, by the governing bodies. The recent establishment of the Mar Piccolo Regional Park in the area in front of Taranto and the Blue Oasis project represent a significant stage in the revitalisation and promotion of the city through the enhancement of its peculiarities and potential.

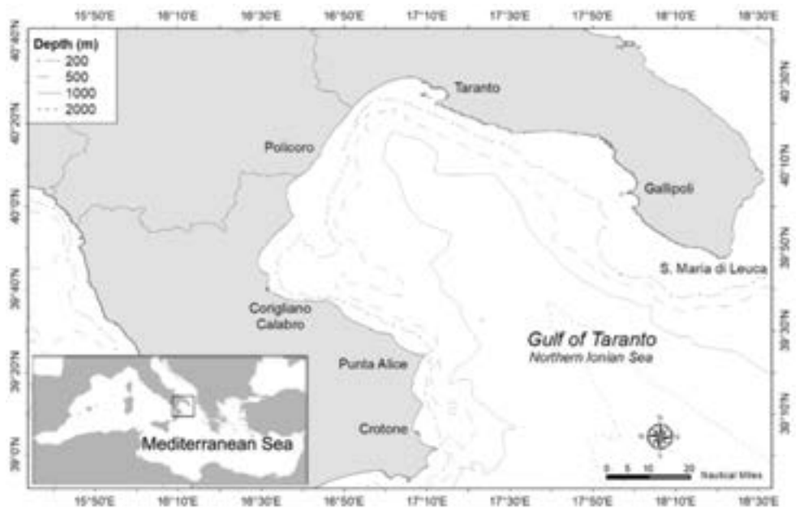


Figure 12: Gulf of Taranto

Scientific data collection

The area of interest is, as mentioned, the Gulf of Taranto (northern Ionian Sea, central-eastern Mediterranean Sea), which covers an area of approximately 14,000 km² and is the stretch of sea that bathes three regions of southern Italy: Puglia, Basilicata and Calabria. The boundary line enclosing it stretches from Santa Maria di Leuca (in Apulia) to Punta Alice (in Calabria) and is 60 nautical miles long. Legally, the Gulf is defined as a 'historic bay' by Presidential Decree No. 816 of 26 April 1977 and therefore Italy has always considered it to be an inland sea forming part of the territorial waters under the complete jurisdiction of the State. The basin is characterised by a complex morphology with a narrow continental shelf and a steep slope, with numerous channels in the western sector and terraces in the eastern sector, both descending towards the NW-SE submarine canyon system in the 'Taranto Valley'. This unique morphology leads to a complex distribution of water masses with a mixture of surface and deep waters, resulting in high seasonal variability in upwelling currents.

The cetacean species present and sighted in the Ionian Sea, and in particular in the Gulf of Taranto, do not differ from the cetofauna that is more generally present in the Mediterranean Sea. There are, however, differences in the distribution and abundance of species due to the different geo-morphological and chemical-physical characteristics of the Ionian basin compared to the Tyrrhenian and Adriatic Seas. In general, in the Mediterranean Sea, there are 12 species of cetaceans belonging to the subor-

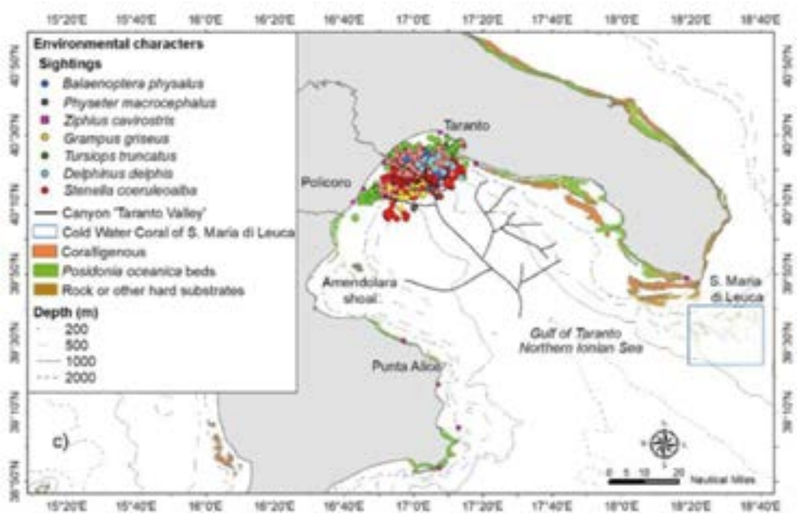


Figure 13: Environmental Characters Sighting Figure: Environmental Characters Sighting

ders of mysticetes and odontocetes.
Among these, we distinguish regular species (permanently present in the Mediterranean area) and occasional species (making occasional appearances in the Mediterranean, especially in the western part). The so-called regular species are striped dolphin (Stenella coeruleoalba), bottlenose dolphin (Tursiops truncatus), common dolphin (Delphinus delphis), bottlenose dolphin (Grampus griseus), sperm whale (Physester macrocephalus), minke whale (Balaenoptera physalus), pilot whale (Globicephala melas), zyphium (Ziphius cavirostris); while the minke whale (Balaenoptera acutorostrata), orca (Orcinus orca), pseudorca (Pseudorca crassidens) and steno (Steno bredanensis) are considered occasional species. Each of these species has characteristic ecological requirements, which determine their geographical distribution in correspondence with the environmental characteristics offered by the Mediterranean (oceanographic and physico-chemical variables, depth, distance from the coast, primary productivity, availability of prey, etc.). Research carried out on cetaceans in the Italian seas has revealed the existence of significant differences between the depths of the waters preferred by each species: minke whale and pilot whale are mostly maintained in deep waters, generally deeper than 2000 m; sperm whale, striped dolphin and grampus are more frequent at the continental slope; the common dolphin is generally maintained between the slope and the continental shelf; finally, the bottlenose dolphin is a decidedly neritic (coastal) species, with a marked preference for waters less than 100 m deep. It is important to emphasise, however, how this situation has in fact changed considerably in recent decades, with a drastic reduction in available habitats caused by the ever-increasing human impact and the consequent exclusion of cetacean populations from areas traditionally optimal for them. All cetacean species in the Mediterranean Sea and Gulf of Taranto, in fact, are subject to many threats from man and, many of them, are increasingly at risk of extinction.The percentage of sightings of the various species in the research area monitored by the JDC from 2009 to 2021 and covering an area of 960 km² within the Gulf of Taranto is broken down as follows:
75% striped dolphin (~1250 sightings);
13% bottlenose dolphin (~250 sightings);
8% Grampo (~150 sightings);
3% Sperm whale (~30 sightings);
1% Common Dolphin (~20 sightings).
In addition, a fin whale sighting occurred in 2009.

Figure 14: Stenella coeruleoalba

The striped dolphin (Stenella coeruleoalba) is a delphinid with a grey-black or bluish colouration in the posterior part and white in the ventral part. The peculiarity of its colouration lies in the presence of a black line from the eye to the anal region and another from the eye to the pectoral fin, present on both sides. Striped dolphins in the Mediterranean are slightly smaller than those in the Atlantic and reach a maximum length of 2-2.5 m. They can live in large groups of up to hundreds of individuals. They are very acrobatic and can jump up to 7 metres out of the water. Striped dolphins are common in the Mediterranean basin and are he most abundant cetacean in the Gulf of Taranto.

Figure 15: Tursiops truncatus

Bottlenose dolphins (Tursiops truncatus) are perhaps the best known species of cetaceans because they have been the stars of some films and, above all, because they are, unfortunately, the most common cetaceans in captivity. Their robust bodies are grey, lighter on the sides and white on the abdomen. Bottlenose dolphins are 2.2-3.5 m long. Their groups, usually consisting of females with offspring, usually range from a few individuals to about 20. They live all along the coasts of the Mediterranean Sea. They are a coastal species and, because of this, suffer more from the effects of human pressure.
Grampuses (Grampus griseus) have a grey colouration at birth, which becomes increasingly lighter

Figure 16: Grampus griseus

with age, mainly due to the formation of distinctive scars on their bodies. They are medium-sized cetaceans and can reach up to 4 m. The average size is about 3-3.5 m. They generally live in groups of between 3 and 50 individuals, although groups of several thousand have sometimes been found in the ocean. In the Mediterranean Sea, they are most abundant in the western basin, where they prefer continental slopes and submarine canyons. Their conservation status is still poorly known and they are classified as DD (Data Deficient) by the IUCN.
Sperm whales (Physeter macrocephalus) are the largest odontocete cetaceans, are among the lar-

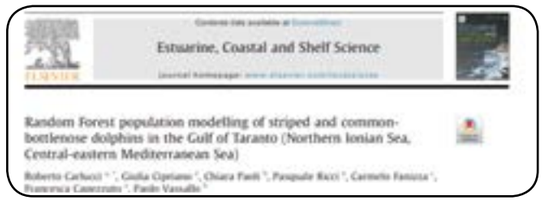
Figure 17: Physeter macrocephalus

gest cetaceans in the Mediterranean Sea and are the largest predators on the planet. An important clue to their identification is their snort because it is unique in the cetacean world: it is directed downwards, to the left and forwards. Their head represents 1/3 of their total body length. They are dark or grey animals, with a white lower part of the mouth. To dive, they show their caudal fin out of the water. They can be up to 20 m long and males are generally larger than females (length of males: 18-20 m, length of females: 13-15 m). Their groups consist of females and their offspring while young males and adult males are usually more solitary. There is evidence of a sub-population of sperm whales in the Mediterranean Sea and they are classified as an endangered (Endangered) species by the IUCN.

Figure 18: Delphinus delphis

The common dolphin (Delphinus delphis) is easily recognisable by the typical colouration of its body: the dorsal region is dark and the sides are cream or yellow and form a V in the middle of the body. Like striped dolphins, they are rather small animals compared to other cetacean species (about 2.5 m). They live in numerous groups of 10 to 200 animals, and sometimes groups of several thousand have been sighted. Despite their name, it is very difficult to observe them in the Mediterranean Sea and they are classified as a critically endangered species. It has been calculated that their population has been reduced by half in the last 40 years. They are, in fact, the least numerous cetacean species in our sea and are highly endangered.
The Citizen Science activities carried out by the Jonian Dolphin Conservation have made it possible, over the years, to collect a huge amount of scientific data concerning the cetaceans present in the waters of the Gulf of Taranto and, as mentioned, there are dozens of scientific publications by the JDC research team. The activities carried out have followed (and still follow) different research methodologies that we report below, along with some of the scientific publications produced by the JDC team, one for each type of research, in order to make the impact and value of their work even more concrete and tangible.

Visual Surveys:
When the species of interest are identified, data collection begins using the distance sampling method, described below. In addition, in recent years, drones have been used to collect even more useful data.


Estuarine, Coastal and Shelf Science

Random Forest population modelling of striped and common-bottlenose dolphins in the Gulf of Taranto (Northern Ionian Sea, Central-eastern Mediterranean Sea)

Photo-identification:
Special markings such as scars form naturally on some cetacean species such as bottlenose dolphins, grampuses, common dolphins and sperm whales and are unique to each animal, like a fingerprint.
The collection of photographs provides useful data on individuals that can thus be identified and observed over time, studying their movements, migrations and index of association.

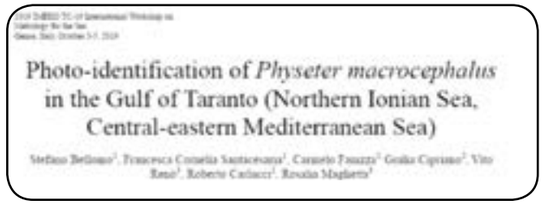
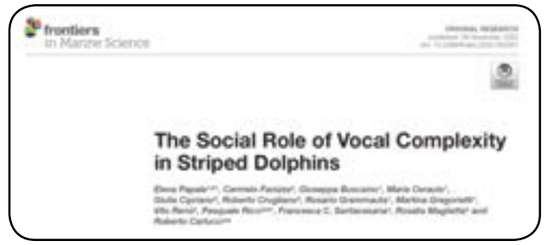


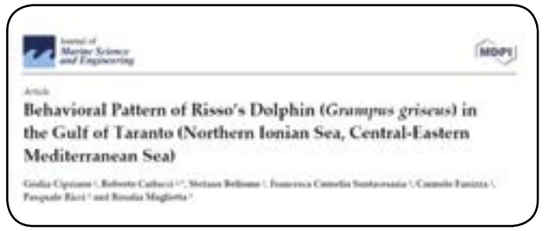
Photo-identification of *Physeter macrocephalus* in the Gulf of Taranto (Northern Ionian Sea, Central-eastern Mediterranean Sea)

Bioacoustics:
The aim of this research using hydrophones is to understand the relationships between the behaviour of cetaceans and their language and to monitor underwater noise that can pose a serious threat to these animals.


frontiers in Marine Science

The Social Role of Vocal Complexity in Striped Dolphins

Ethology:
Ethological sampling activities, i.e. of animal behaviour, are carried out, which are of fundamental importance for implementing correct land management actions.


Behavioral Pattern of Risso's Dolphin (*Grampus griseus*) in the Gulf of Taranto (Northern Ionian Sea, Central-Eastern Mediterranean Sea)

Genetics:
Samples of cetacean skin are taken using soft-touch methodology, i.e. a non-invasive methodology that allows samples of the outer layer of the animal's skin to be taken for population genetic studies.


PLOS ONE

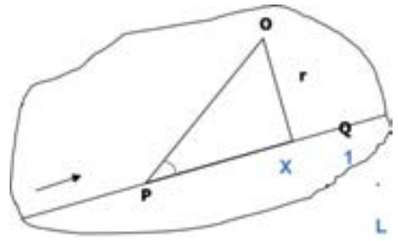
Cytochrome b marker reveals an independent lineage of *Stenella coeruleoalba* in the Gulf of Taranto

Parasitological analyses:
Fecal sampling of live individuals for parasitological analysis and post-mortem analysis of stranded individuals are carried out in order to understand the causes of death and link them to possible anthropogenic impacts.


Journal of Experimental Marine Biology and Ecology

Exploring data from an individual stranding of a Cuvier's beaked whale in the Gulf of Taranto (Northern Ionian Sea, Central-eastern Mediterranean Sea)

Monitoring activities are carried out through the most widely used method for estimating the density and/or abundance of natural populations, namely, distance sampling, whose literal translation is sampling at a distance. The linear transect is widely used in various animal and plant taxa, including trees, insect plants, amphibians, reptiles, birds, fish and marine and terrestrial mammals. The observation of one or more research units is conducted along a series of straight line segments in search of objects of interest; these are usually animals or clusters of animals. The standard theory of the linear transect has been well developed and routinely applied to a wide variety of wild population estimates in both marine and terrestrial habitats. Counts of animals (groups or individual specimens) are carried out along predetermined paths (transects) within the area of interest (study area), travelled by various means at constant speed. The investigated area is defined by calculating the distances (r) as the crow flies of the animals (P) from the observer (O) and the angle (α) formed by the straight line r and the segment O-Q on the direction of the path (see figure) and from these the distances (X), on the perpendicular, between animals and path.



O = Observer position
P = animal position or groups of specimens
r = distance between O and P
α = angle formed by OQ and OP
X = perpendicular distance of point P on the transect
L = total length of the transect

Knowing the path length (L), based on the total number of animals observed (N) on both sides of the path and the average of the perpendicular distances (X), the density (D) is estimated with the equation:
D=N/(2XL)
To this end, it is necessary:
correctly calculate angle α at the moment of contact; estimate the distance between the observer and the animal or group of animals sighted; estimate the number of animals at the time of eye contact.

Anthropogenic activities impact assesment

The JDC is not only dedicated to Citizen Science activities and the description of parameters related to what has been observed on cetaceans but, again in collaboration with various academic realities, has been working, especially in recent years, to assess the impacts of human activities in the Gulf of Taranto area. The pivotal work in this process is undoubtedly 'Managing multiple pressures for cetaceans' conservation with an Ecosystem-Based Marine Spatial Planning approach.


Journal of Environmental Management

Managing multiple pressures for cetaceans' conservation with an Ecosystem-Based Marine Spatial Planning approach

In this work, direct and indirect pressures determining potential impacts on cetaceans were identified through the use of multiple sources of knowledge (empirical evidence, information from the scientific literature and local expert knowledge).

Of the documented direct pressures, underwater noise is the one with the greatest impact. It can be

caused by a variety of sources, namely: exploration for hydrocarbons, maritime transport, coastal tourism and development, and military exercises.

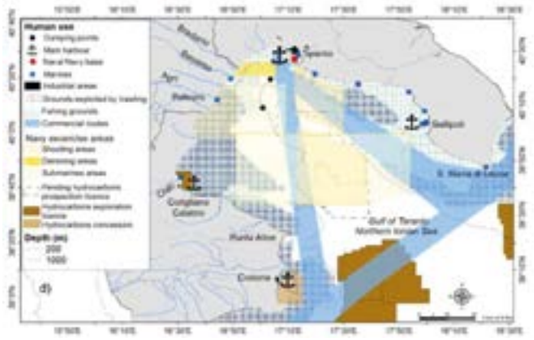


Figure 19: Human Use Map

Underwater noise potentially covers the entire Gulf, as it can propagate over long spatial intervals. This pressure is known to affect all cetacean species, in particular Z. cavirostris, B. physalus and T. truncatus. Both naval sonar from military activity and air-gun surveys for oil and gas are the main causes of underwater noise that can potentially lead to lethal injuries to cetaceans.

Figure 20: Underwater Noise Map

Such lethal events, however, are rare, while underwater noise leading to medium-level disturbance is produced more frequently (daily or seasonally) by military activities, sea transport of trade routes and recreational activities.
Marine litter, i.e. solid waste in the sea, is the second most impactful anthropogenic activity. It potentially affects all cetaceans indiscriminately. Several agents contribute to the spread of litter, related to coastal development and tourism, fishing and maritime transport.

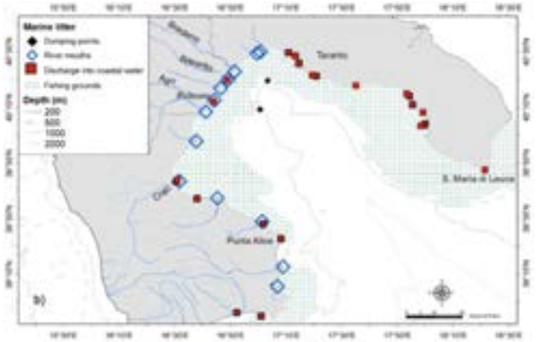


Figure 21: Marine Litter Map

The main source is river mouths, beaches and areas where fishing activities take place. Even more lethal is the impact generated by the loss of fishing gear, which can result in so-called ghost-fishing, i.e. the continuous capture and killing of marine animals by fishing gear (such as nets and long-lines) dispersed in the sea, on the surface or in the water column.

Figure 22: Human activities on Cetaceans

Collisions with vessels and bycatch are very rare in the study area. Only in a few cases are scars reported on small odontocetes potentially attributable to collisions with recreational boats. However, lethal effects due to ship collisions, mainly on B. physalus and P. macrocephalus, are more frequent in other study areas in the Mediterranean Sea and in the Atlantic and Pacific Oceans.

This is why it is a phenomenon that should not be underestimated. Ship collisions, being a localised pressure, could occur on new traffic routes in the Gulf that may occur in the near future.

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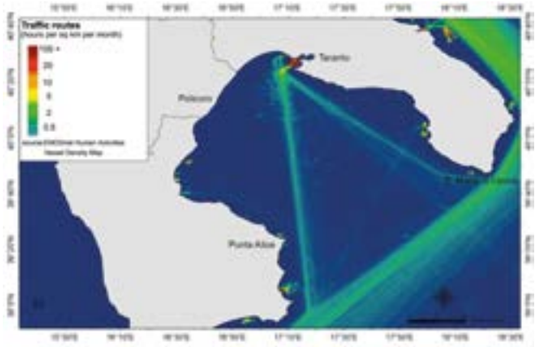

Figure 23: Traffic Routes Map

Regarding indirect pressures, competition from disturbance or prey depletion and habitat degradation are the strongest pressures. The impact of fishing actions and naval gunnery exercises can cause disturbance of cetacean prey.

Figure 24: Competition/ disturbance preys

In this case, the JDC team specifically identified the areas affected by trawling because of their known effect on the trophic food web, and a separate study was carried out, through which it was observed that this type of fishing is closely correlated with the depletion of the prey of odontocetes, and in particular T.truncatus.

Addressing Cetacean–Fishery Interactions to Inform a Deep-Sea Ecosystem-Based Management in the Gulf of Taranto (Northern Ionian Sea, Central Mediterranean Sea)

Finally, a further dedicated study by the JDC team is on the impact of its vessels on the ethology of grampuses (Grampus griseus). This study aims to lay the foundations for legislating the dolphin and whale watching activities that are becoming increasingly popular in the Gulf of Taranto.

This legislative process is obviously not intended to ban such ecotourism sources but to regulate them, so as not to disturb cetaceans by ensuring that the 'lines of good conduct' in the event of a sighting are not just indications but rules that must be followed, on pain of making it impossible to carry out such ecotourism activities. This action is necessary to prevent the negative and sometimes irreversible impacts that excessive development of such activities can bring, as has already occurred in other places in the world where dolphin & whale watching are the main sources of impact for cetaceans.

Impact of cetacean watching vessels on Risso's dolphins behaviour in the Gulf of Taranto: preliminary information to regulate dolphin watching

Conclusions

As clearly evidenced by the various studies and the impact of JDC activities, the Gulf of Taranto is included in several site selection criteria for all cetacean conservation initiatives in the Mediterranean Sea, both at national and regional level, however, none of these areas have yet been implemented.
This implies that if the area is not, in the short term, protected and managed in the most correct way, no ecotourism action can be perpetrated in the long term, as the natural resources that allow ecotourism activities themselves to flourish are at risk.
Here, the contribution of the users of JDC's citizen science activities, from primary school students to citizens and tourists, is crucial. Safeguarding the biodiversity of an area is no longer a field reserved only for scientists and researchers. This includes activities that produce work in the field of tourism and at the same time protect the environment and enhance its sustainability by playing an extremely important educational and cultural role, which can (and must) increase the pressure on decision-ma-

kers.
Activities such as the JDC described in this work are repeatable in any environment, as there are no places that present limits to citizen science other than the training of appropriate figures whose role is to disseminate the knowledge acquired and make it available to the widest possible public. The awareness and enthusiasm of the new generations involved in these kinds of ecotourism activities lead to a greater focus on environmental protection and the preservation of our planet's resources, and are therefore fundamental processes in the training of future land operators and decision makers. The public and private sectors must work synergistically so that these processes are increasingly facilitated, thus enabling an easier diffusion of a vision of sustainable development that places the considered, farsighted and shared use of natural resources at the centre.

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Territory Analysis - National Tourism Agency, Albania

Context

The contribution of the tourism sector to the national economy is significant, especially in terms of employment and foreign exchange earnings from exports. The sector's high contribution to employment is a result of the sector's labour-based nature (EU Progress Report, 2018). Year after year, tourism is becoming increasingly crystallized as one of the main engines of the country's economic development. According to the Economic Impact Report of Travel and Tourism 2018, of the World Travel and Tourism Council1 (WTTC), throughout 2017, the sector of tourism recorded a direct contribution of $1.12 billion, making up about 8.5% of the Gross Domestic Product (GDP), meanwhile, including the indirect multiplier effects, the total contribution is almost three times higher at $3.47 billion, making up about 26.2% of GDP, positioning this sector as one of the main contributors to the development of the national economy (World Travel and Tourism Council, Travel and Tourism Economic Impact Report (2018). During 2017, the sector generated 7.7% of employment in the form of direct employment, or otherwise 93,500 jobs. Indirect employment of the sector is estimated to represent 24.1% of total employment (Ministry of Tourism and Environment, Sustainable Tourism Development Strategy 2019-2023).

Tourism remains essential to maintain the balance of the current account since we have a contraction of remittances and FDI in foreign currency. Tourism exports represent 54.2% of total exports, with a value of USD 1,974.1 Million (in 2017). Investments in the sector during 2017 increased by 7.5% and reached a value of USD 269 Million. Investment dynamics in the sector are expected to be optimistic for the coming years.
The Ministry of Tourism and Environment reports that at the national level, there are nearly 3,800 accommodation structures which have about 29,000 rooms or 67,000 beds for visitors per day. The largest number of capacities (beds) offered is in Shkodër (19,000 beds), Vlora (18,500 beds), Tirana (11,000 beds), and Durrës (4,500 beds). New historical and cultural destinations such as Korçë, Gjirokastër and Berati are reported to have less than 2,000 beds. Accommodation structures at the national level are dominated by hotels or similar structures to the extent of 65%, resorts provide only 1% of accommodation capacity, guesthouses 3%, private houses, private rented rooms in private houses or apartments are reported to provide about 30 % of total beds at national level.
Accommodation structures and other services offered to tourists are channeled through a network of approximately 46 tourist operators and 154 travel agencies (National Tourism Strategy, 2018).
The tourism sector is moving very quickly towards massification, during the tourist season of 2018, 4.4 million foreigners visited Albania, compared to 2017, the number of visitors increased by 12%. The percentage of foreign visitors who choose Albania as a holiday destination is 49%. Among visitors, the most dynamic group are those who come for a day in Albania, this group represents 10% of visitors and which is considered almost doubled during 2018, if we compare it with 2017 (INSTAT, 2018)

According to the data referred by the Ministry of Tourism and Environment, in the National Tourism Strategy 2018-2020, visitors arrive in Albania mainly by road transport (81.1%), by plane (11.3%), and by sea transport (7.5%). The improvement of air and maritime transport represents an opportunity for the tourism sector, since these potentials are currently used below their capacity and policies to improve costs can address the more efficient use of alternative transport by tourists.
Relying on tourism resources, the "niche" product that Albania plans to support is planning to strategically support both coastal and cultural tourism, health, eco-tourism, rural tourism and mountain walks combined with specific cuisines and tradition. Despite the developments in the sector, Albania remains a new tourist destination, with the challenge of positioning itself in the world market. The analysis of the dynamics of the number of visitors (vacationers or daily visitors) provides an

opportunity for the sector from the demand side, however these dynamics need to be analyzed with the demand for quality and competitiveness also from the demand side. Understanding the specifics of the sector from the supply side remains very important for investors, given that many of the challenges the sector faces today are related to supply.

Analysis of the tourist market in Albania

Geographical overview

Albania is a small country with a landmass of 28,748 square km. It is situated in the western part of the Balkan Peninsula in southeastern Europe. It shares borders with Montenegro and Kosovo to the north and northeast, Macedonia to the east and Greece to the south. To the west, Albania coast abuts the Adriatic and Ionian seas. The Adriatic separates Albania from Italy via the Strait of Otranto (72 km). Much of Albania's surface is mountainous – the average height above sea level is 708 m, and its highest peak, Mount Korab on the Macedonian border, is 2,753 m. Most of the population lives in the south – central lowlands and along the coastal plain.

Figure 1: A lbanian Map

Albania lies in the subtropical belt and has a Mediterranean climate, with relatively short and mild winter and hot and dry summers. The climate of Albania varies a lot from one region to another with big contrasts in terms of temperature, rainfall, sunshine, air humidity, etc. The annual rainfall is on average 1,430mm per year, decreasing from west to east.

The Ionian Cost is very rugged with rocky coves along the narrow coastal strip and steep mountainsides rising directly from the water for much of its length. The highest point along this stretch is at the Llogara Pass, over 1,000 m high. Geological activity and erosion have created many caves at the base of these cliffs, some of which were inhabited in prehistoric times.

Figure 2: Llogara

The Adriatic coast is low lying, with large protected bays (such as those of Vlora and Durrës), which have been used as harbors since ancient times.

The rivers that flow into the Adriatic have created fertile alluvial plains on these lowlands and, at their mouths, exceptionally rich wetlands, which are home to many waterfowl and migratory birds.

Lake Shkodra (Skadar) is the largest lake in the Balkans and straddles the border between Albania and Montenegro. It is relatively shallow and is fed by many rivers as well as by springs, making it quite varied in aquatic life, with various species of carp and trout.

Lake Ohrid is shared between Albania and Macedonia, and is found in the southeastern part of Albania. Around the shore there are a number of tourist areas such as Lin, Pojska, Pogradec,

Tushemisht, and Drilon. It is exceptionally deep and fed mainly by springs around the edge of the lake and on its floor.

South of Lake Ohrid lies Prespa Lake, which is distinguished by its solitude and beautiful landscapes. In this lake one finds very important breeding populations of Dalmatian and white pelicans. Lakes Ohrid and Prespa are between two and four million years old and have uniquely evolved species of fish, among them the Ohrid trout and Belushka.

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Figure 3: Ohrid Lake

Albania is a country rich in rivers. The country has many rivers which originate in the high mountains and pass through steep gorges before reaching the plains and making their way to the sea. Most of the main rivers have been extensively managed, usually to generate electricity. Albania has

nearly 450 km (280 mi) of coastline, with the Adriatic running from the Montenegrin border south to the Bay of Vlora, where the Ionian Sea begins.

The rivers create numerous valleys with spectacular views and offer opportunities for development of water sports. We should mention here the Osum canyon in Çorovodë, Gradec canyon, also along the Osum River, Këlcyra gorge on the Vjosa River, the Bënça Canyon in the Kurvelesh area, the

valleys of Valbona and Shala in the Albanian Alps, the valleys of Tomorricë and the Skorana Gorge on Erzen River, etc. You will also find waterfalls with magnificent view, such as that of Grunas in Theth, in the Albanian Alps, that of Shoshan in the Valbona Valley, the waterfall of Kokotraf in Konispol, the waterfall of Progonat in Kurvelesh

Features of socio-economic development

Albania is an upper middle-income country on its path to EU accession. GDP per capita in Albania in 2019 was USD 5,448 (current USD; WB), one of the lowest in the region and less than half of that of the new EU member states. In 2018, it stood at 31 percent, a slight increase on the level of 29 percent in 2010 (Eurostat). Over the past decade, Albania's economy has witnessed a steady growth, by an annual average of 2.4 percent. In 2019, the country witnessed an economic slowdown, caused by weaker power production and a severe earthquake in November, and growth expanded only by 2.2 percent, compared to 4.1 percent in 2018. In 2020, the economy was projected to grow by an estimated 3.5 percent. However, due to the COVID-19 pandemic and the subsequent containment measures, the GDP is now expected to contract by five percent in 2020 (International Monetary Fund, IMF; Figure 1) and the economy is facing simultaneous demand, supply and financing shocks. The demand for goods and services, both in the domestic and foreign markets, has experienced a rapid decline due to COVID-19.

In April 2020, exports decreased by 44 percent from the level in April 2019, and imports by 37 percent. In 2019, remittances comprised 9.4 percent of GDP (WB), though they are now also expected to drop due to the global pandemic. In the short to medium term, post- earthquake recovery efforts and the COVID-19 economic stimulus packages are expected to give an additional boost to the economy and help the economy grow again.

In 2018, the country ranked 69th on the Human Development Index (UNDP 2019). The Human Development Index (HDI) has been improving over the past decades but remains one of the lowest in the region (Figures 2–4). While Albania's economic growth has been stable, its acceleration is paramount for achieving convergence with the aspirational EU standards as the country is still one of the poorest in Europe.

In 2018, the at- risk-ofpoverty rate in the population was 23.4 percent, while the average of the EU-28 countries was 16.9 percent (INSTAT Survey on Income and Living Conditions, SILC 2019). Additionally, expansion of the tax base and reduction of the informal economy , where women are concentrated without adequate labour and social protection, are major challenges (WB Enterprise Survey 2019) that need to be addressed. The national minimum wage is USD 232 and the average, USD 470 (31% of the EU average). INSTAT data indicate that average gross monthly wages in the formal sector in Albania were 6–8 percent lower for women than for men during 2014–2016 (SDG Mainstreaming, Acceleration and Policy Support, MAPS 2018). In the third quarter of 2019, the labour force participation rate for the population of age 15–64 years was 69.8 percent (INSTAT LFS). Data on the gender wage gap in the informal sector, where a large share of women are employed, is unavailable. Women's labour force participation rate is 62 percent, while for men the figure is 77.7 percent.

The registered unemployment rate has continued to decline and, in the third quarter of 2019, reached 11.4 percent for both men and women, with youth unemployment reported at 21.4 percent.
Albania is ranked 81st in the World Economic Forum (WEF)'s Global Economic Competitiveness Index. The country scores well in terms of its human capital but is uncompetitive in terms of innovation, research and development capabilities, entrepreneurial culture and transport infrastructure. Albania ranks 85th with the World Bank's Doing Business indicator. Persistent weaknesses in the legal framework (e.g., property rights and contract enforcement), along with known difficulties in obtaining construction permits, paying taxes, and accessing electricity affect the country's investment climate. Albania's net inflows from Foreign Direct Investment (FDI) have reached an average of 8.4 percent of GDP in 2018, being one of the highest in the region (Figure 5).
FDI is concentrated mostly in electricity, extraction industries and telecommunications and sourced from a few countries (WEF, Growth Lab, CID Harvard). The country is highly dependent upon hydropowergenerated energy. The economic disruption caused by weak power generation in dry years when the country needs to rely on imports, underlines the need for urgent efforts to increase the share of renewable energy sources other than hydropower. Introduction of renewable sources of energy and connection to natural gas supplies from abroad following implementation of the Trans- Adriatic Pipeline (TAP) project are priorities. Liberalisation of the energy market remains a challenge. The Albanian economy is dominated by services, including tourism, which contribute a large proportion to the country's GDP, reaching 47.9 percent in 2018, a 43. See UNCTAD Investment Policy Reviews (IPR) of South-East Europe 5.4 percent increase on the level in 2017 in real terms. Nevertheless, agriculture remains very important, accounting for 18.4 percent of GDP, a 1.4 percent increase on 2017. Both tourism and agriculture are characterised by a high of informality and a large female labour force. The other main contributors to GDP (21.3%) in 2018 were industry and construction. In the last two decades, emigration and urbanisation have created a structural shift away from agriculture towards industry and services, leading to diversification of services within the Albanian economy—including banking, telecommunications and tourism—while the manufacturing sector contributed 5.9 percent to GDP in 2018. Albania's transition growth model has arguably reached its limit. In order to fulfil its potential, like other countries in the region, it needs to address the middleincome trap.
While growth has been significant, there has been little diversification in the portfolio of goods that Albania exports: agricultural, food, garments and minerals. Such diversification is a key challenge for the country's economic growth. As most of these exports are easy to produce, new production lines with higher complexity will bring greater value to the economy. Innovation, smart skills and readiness to adopt the digital agenda will have to be the new drivers of economic growth. In face of the wide range of socio-economic and environmental challenges to inclusive and sustainable industrial development caused by the COVID-19 pandemic, a particular focus is needed for institutional transformation and innovation, innovative clusters and ecosystems, and industrial modernization of MSMEs, as well as inclusive capacity-building and technological training. Capacity-building in industrial security and safety, organisational resilience and innovation management, and promotion of knowledge exchange on business continuity and recovery are essential to support and stabilise the fragile business environment in Albania. Further strengthening the ties of cooperation and interdependence within the Western Balkans region can support the economic growth of each country, including Albania.

Digitalisation

Digital infrastructure is a precondition for development of the digital economy and innovation in industry, e-Government, e-Health, provision of interoperable services and of cross- border services (Albania Economic Reform Programme 2019–2021). The advent of 5G has the potential to contribute to all the sectors of the economy, creating new jobs, stimulating economic benefits and providing a higher quality of public services, eventually paving the way for a qualitative policy debate towards the fourth industrial revolution. Given the importance of the agricultural sector for the Albanian economy and labour market, e-agriculture and promoting connectivity, digital infrastructure and skills among agro-business establishments and labour force bears an important potential for

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up-scaling this sector.

Agriculture

Agriculture continues to be one of the main economic pillars of Albanian economy, contributing 19 percent to the country's GDP (INSTAT 2019) and providing jobs to one-third of the people employed in the country. Growth Value Added (GVA) in agriculture has increased by two- thirds since 2007, reaching about EUR 2.33 billion in 2018. In 2019, 41.6 percent of women and 32.3 percent of men were working in the agriculture sector, though land ownership continues to disproportionately affect women negatively. , as titles are more often in the names of male relatives.
In 2019, only 31 percent of women compared to 52 percent of men aged 15-59 years owned a house,. INSTAT: Survey "Information and Communication Technologies usage in Households and by Individuals (ICT)" conducted in 2018/2019 UN Women: Country Gender Equality Brief Albania 2020, forthcoming. UNESCO: The Intersection of Gender Equality and Education in South-East Europe: A Regional Situation Analysis of the Nexus between SDG4 and SDG5, May 2019 while 17 percent of women and 28 percent of men owned land, hence limiting women's access to economic activity. In the last decade, the sector has become more efficient, farms have become more productive and profitable, and labour productivity measured as GVA/ full-time employee has more than doubled since 2005, while the number of agricultural holdings (farms) has decreased by six percent since 2005 (from 375,000 to 352,000). Despite these advancements, however, women continue to be left behind in a number of areas. Women continue to have limited access to technical agricultural information and business development services, markets and decisionmaking fora– primarily due to persistent traditional gender roles dictating that men engage in formal economic activities, while women and girls engage in unpaid agricultural work and household chores.

Industrial sector

The industrial sector in Albania is characterised by low productivity, limited product or process diversification and sophistication, and weak competitiveness. The sector almost collapsed during the transition to a market economy. Industry's contribution to GDP (including construction) has grown steadily, from 13.8 percent in 2010 to 21.3 percent in 2018,53 mostly through improved performance in extracting and mining, while manufacturing (especially textiles) has slowed due to weaker demand from Greece and Italy. The major industries in which Albania has a competitive advantage are mining, footwear, textiles and agribusiness. International Labour Organisation (ILO) data indicate that manufacturing jobs account for less than ten percent of total employment, with textiles, food processing and other relatively small-scale, lowpay and labour- intensive branches generating most of this employment. INSTAT 2019 data on the Textile and footwear subsector indicate that out of the 70,000 total number of workers, 60,000 are women and 95 percent of women are from suburban areas. In 2019, women made up 14.8 percent of those employed in manufacturing while men made up 7.9 percent. Men dominated the sub-sectors of construction (12.2 percent men compared to 0.6 percent women), s well as mining and quarrying, electricity, gas and water supply (3.2 percent men compared to 0.8 percent women).

Trade

The total trade volume in 2017 amounted to EUR 1.23 billion, an increase of 15 percent compared to 2016. In 2017, Albania's exports of goods and services amounted to around 31.5 percent of GDP and imports of goods and services around 46.6 percent. Albania remains only partially integrated into regional value chains, because it suffers from limited connectivity, and the quality of infrastructure needs to be improved.
The Business and Investment Development Strategy 2014 – 2020 identifies commitments to sustainable economic development by focusing on and augmenting the contribution that women make to the economy. The document contains the Women's Entrepreneurship Action Plan as an official Annex. However, the pace of women's economic inclusion through private sector development remains slow, especially for women in rural areas. Infrastructure Infrastructure remains a key development priority for governments around the world and is a core element of the SDGs, with infrastructure impacting the achievement of 92 percent of all SDG targets. Infrastructure delivery is overseen by the Ministry of Infrastructure and Energy (MIE), though all levels of government are allocated infrastructure management and oversight responsibilities. As part of Albania's National Strategy, infrastructure

is regarded as the highest priority area.

Energy

The energy sector is of key importance for Albania's economic, strategic and social development. The focus continues to be on the provision of primary energy sources and building of the infrastructure necessary for the safe supply of energy. Energy generation in the country is entirely dependent upon hydro resources. Historical unpredictability of hydropower has translated into output volatility and caused economic disruption during dry years when the country needs to rely on imports. Albania is considered a water-rich country with an Actual Renewable Water Resources per capita of more than 13,000 m3 , and a total installed energy capacity of 1.8 GW, dominated by hydropower plants. Water resources are its most important natural resources and the general hydropower potential is assessed up to 4,500 MW. Currently, 35 percent of the hydropower potential is used.

Sustainable Tourism

In recent years, tourism in Albania has been growing to become a main engine of the country's economic development. In 2018, the sector recorded a total contribution (including indirect multiplier effects) of USD 4.3 billion, accounting for about 27.3 percent of GDP (World Travel and Tourism Council, WTTC, 2019; Post-Disaster Needs Analysis, PDNA, 2020), an increase on the level of 26.2 percent in 2017. The sector is now one of the main contributors to Albania's economic growth, and projections for 2028 show international arrivals increasing to 6.6 million. The contribution of the sector to total formal employment in the country in 2018 was 25.2 percent, while travel and tourism generated 54.2 percent of all exports in 2017.

By November 2019, more than 6.1 million non-residents had visited the country, 8.3 percent more than in 2018. However, revenues per tourist have been declining as tourism receipts as a share of GDP have been stagnating, indicating that the sector's full potential is still to be reached. The tourism sector has been hit hard by COVID- 19, highlighting the importance of diversifying the economy to make it more resilient to both internal and external shocks. At the same time, given the high degree of informality and women's significant engagement in this sector, integration of a gender perspective in Albania's tourism development policy is essential. Further contributing to resilience, stronger emphasis also needs to be placed on supporting the sector's potential to positively impact on economic empowerment, diversification of local value chains, and sustainable rural development. The full potential of the tourism sector in Albania, is still to be reached. Tourism and the interconnected activities of restaurant, culture and leisure industries, can play a key role in the economy, as a source of income and employment. More investments are needed in eco-friendly infrastructure and climate and resilience need to be embedded into tourism sector strategies. Accordingly, environmental monitoring in the tourism sector needs to be stepped up to support policy development and strategic planning, and to manage tourism in a sustainable manner at the local level.4

Population

According to the latest annual report of the National Institute of Statistics (INSTAT), the population of Albania on 1 January 2020, was 2,845,955 inhabitants, a decrease of 0.6 percent over the previous twelve months. The sex ration of the total population in 2018 has also decreased to 100.1 men for 100 women, from 101.3 in 2017. From a very high growth rate of about 2.4 percent per annum prior to the collapse of the communist state in 1990, the population has been steadily falling, by an annual 0.33 percent from 1990 to 2001, to 0.91 percent from 2001 until 2011, with a trend that continues to the present day. The main component of this negative growth has been mass emigration. It is estimated that more than 700,000 Albanians left the country between 1989 and 2001, with a trend that continues to the present, with the population losing another 265,640 people in between the two censuses of 2001 and 2011 (2,802,100 according to Census 2011).

Thus, one-third of the country's population have emigrated since 1989. While population growth is negative and net emigration is very high, the level of fertility is very low. In 2018, Albania's overall fertility rate was 1.38 children per woman, one of the lowest in Europe. This is a dramatic change given the country had the highest fertility rate on the continent when the communist regime collapsed. Meanwhile, the mortality rate is low, and life expectancy is continuing to increase, one of the highest in south-east Europe. In sum, in 2020, Albania has a demography characterised by a low level of childbearing, long life expectancy and high rates of emigration.

Continued emigration is a defining characteristic of contemporary Albania, with multiple effects upon demography, but also on the economy and social care, and breaking traditional norms and values. Migration is by far the most important demographic process over the past three decades, causing the population reduction since 1990. Both internal and external migration are unprecedented over this period. In terms of internal migration, there is a concentration of population in the main cities of Tirana and Durres, with movements mainly from the north of the country. It is estimated that one- third of Albania's population emigrated between the censuses of 1989 and 2011. Migration has affected more the reproductive age groups (active population), and the number of children born per woman has decreased. It has also affected the labour market, where for the first time a lack of labour force supply can be detected, with Albania unable to make use of the normal demographic dividend. Demographically, migration has also affected another very important phenomenon: ageing of the population. While the number of the economically active has dipped due to emigration, the elderly population has increased as a result of improvements in longevity.

Consequently, the proportion of the population older than 65 years has increased, from 5.5 percent in 1990 to 14.7 percent in 2019, and estimated to increase to 20.7 percent by 2030. The level of migration and its importance for the demography, economy and social life of the country requires thoughtful policies that consider the promotion of circular migration, remittances, care for the elderly and economic and cultural preservation of towns outside of Tirana.

While the Ministry of Internal Affairs collects, analyses and publishes data on migration, there is a lack of disaggregated information that would enable a full assessment of the profile of the migrant workers abroad to inform the development of national policies and plans of action to address the drivers of migration, including facilitating access to their rights in the areas of employment, education, housing and social services *(Common Country Analysis 2020 United Nations Country Team, Albania fq 14)*

Central and local policies that favor the sustainable development of tourism

Strategies in favor of the development of sustainable tourism at the central and local level

Through its central policies in the development of culture and the protection of nature, the development of investments in tourism, the Ministry of Tourism and Environment in the main priorities for the development of tourism has taken necessary steps to consolidate the competitiveness of the sector.

The Economic Reform Program 2017-2019 presents for the country a number of measures supported by budget allocations to address the needs of standardization of tourist activities. The central policies have also advanced in the creation of the legal framework and strategies to support the sustainable development of tourism. The Draft Strategy for the Sustainable Development of Tourism is following the drafting of the government's strategic legal packages to complete the necessary regulatory framework in the direction of tourism development. This legal regulator assesses tourism as a strategic and priority sector of the economy, with high social and community impact, and establishes protection and respect for the environment as a non-negotiable criterion for any planning and development in the tourism sector.

The main policy priorities in the field of tourism at the central level are: **1.** Increasing the contribution of tourism to the country's general income, **2.** Balanced development of tourist offer and services, **3.** Increasing employment in the tourism sector, **4.** Improving the standard of living and alleviating poverty in tourist areas throughout the country, **5.** Increase in spending on tourism (public investments), **6.** Increase in income from tourist activities and services and **7.** Ensuring legal and institutional protection of the rights of travelers and visitors.

In fulfilling these important strategic priorities, the work is coordinated at the inter-institutional level and the importance of cooperation is expressed through the drafting of long-term strategic policies as well as through the drafting of joint cross-sectoral strategies, such as: National Strategy for Development and Integration 2015-2020; The General National Plan 2015-2030, which defines the main

orientations of tourism development based on the potential of the territory by classifying the areas based on the tourist potential, as Areas of National Importance for the values they have in the planning and sustainable development of the territory, Policies strategic plan for the protection of biodiversity, based on the recreational values that biological diversity brings and that of the landscape as an asset, which can be used to promote the development of tourism, emphasizing responsibility for the protection and development of these values for current and future generations next; The Intersectoral Strategy "Albania's Digital Agenda 2015-2020" that aims at increasing the efficiency of the productive sector, Agriculture, Tourism and Industry through ICT systems; The Intersectoral Strategy for Rural and Agricultural Development 2014-2020 - emphasizes the basis of integrated planning and aims to develop rural tourism and other activities related to tourism, such as cultural tourism, natural and mountain tourism, summer tourism, etc., reconstructing traditional buildings and houses for business purposes, such as accommodation, food, leisure, trade, etc.

According to the strategy, the achievement of the aforementioned goals becomes possible through:

- Promotion and marketing of the tourist image of the country as a tourist destination of special interest; • diversification of the tourist product by expanding it throughout the territory to ensure the integrated development of tourism;
- Development of certification and standardization systems in tourism in order to contribute to the improved quality of services and products in the sector.
- The strategy considers the urban-rural partnership as an integrated approach to achieve a balanced development;
- The Transport Strategy, Business Development and Investment Strategy 2014-2020 - aims to increase priority foreign investments for the economic development of the country, etc.

At the local level, the drafting of local strategies The Strategy and Action Plan for Tourism in Berat for the period 2011-2021, is a detailed plan of the commitment of the Municipality of Berat for the development of tourism during this decade. The plan is an officially approved document, drawn up by the Action Committee for Tourism (KVT) that includes representatives of local government, the private sector and civil society. The plan clearly expresses the vision of Berat to transform into a quality destination developed on the principles of sustainability. It identifies actions in four key strategic areas: creation and improvement of product quality, utilization opportunities and infrastructure, marketing and promotion as well as human resources and destination management. General Local Plan of Municipalities & Territorial Development Plan, another strategic document approved by the Decisions of the KKT, "For the approval of the territory planning regulation".

The detailed Local Plan is drawn up with the aim of:

- Development/redevelopment of an area
- Regeneration of a predominantly urban area
- Construction of public infrastructures
- Change in land use and development conditions
- Public investments affecting the change or redistribution of development conditions
- Programs for the transfer of the right to development and intensity with conditions.

In itself, the development plan is considered as an effective tool for organizing spaces and providing the necessary infrastructure.

Fiscal incentives to attract quality investments

Law No. 93/2015 "On Tourism" and Law no. 114/2017 Amendments to the Law on Tourism provides for the exemption from VAT and Profit Tax for the first ten years of activity for 4-5 star accommodation structures that must invest at least 8 million euros for the 4-star standard and 15 million euros for the 5-star standard. The exemption from profit tax provided for in this legal amendment applies for a period of 10 years to structures that benefit from the special status until December 2024. The effects of the exemption begin at the time of the economic activity of the accommodation structure, but no later than three years from receiving the special status.

Reduction of VAT for accommodation structures from 20% to 6%. The reduced rate of value added tax applied to the supply of accommodation services in accommodation structures, according to the categories defined in the legislation in the field of tourism, is 6 percent10 and began to be applied from June 2017.TVSH 6% zbatohet për çdo furnizim shërbimi të ofruar brenda strukturave akomoduese "Hotel/Resort me 5 yje, status special"6, në fuqi që prej Janarit 2018.

The exemption from the profit tax, provided for in this paragraph for a period of 10 years, is applied to those structures that benefit from the special status until December 2024. According to this provision, the effects of the exemption begin at the moment of the beginning of the economic activity of the accommodation structure, but not later than 3 (three) years from receiving the special status. Exemption from building tax for accommodation structures with 4* and 5* hotel/resort, with special status" according to the provisions of the Law "On Tourism" and which are holders of a registered and internationally recognized trademark "brand name".

Exemption from infrastructure impact tax for accommodation structures with 4* and 5* hotel/resort, with special status" according to the provisions of the Law "On Tourism" and which are holders of a registered and internationally recognized trademark "brand name ". In force since January 2018.

The above fiscal incentives followed the legal changes in Law No. 93/2015 "On Tourism" according to which the government intends to attract international brands in the field of accommodation to build new structures in Albania. Through these changes, the concept of the investor was introduced in the accommodation structures with 4* and 5*, which can receive special status and therefore be subject to these incentives.

Incentives in Agritourism as a growing industry

Reduction of VAT for accommodation structures certified as "agritourism entities" from 20% to 6%. The reduced rate of VAT to be implemented from January 1, 2019 for the supply of accommodation and restaurant services (with the exception of drinks), in structures certified according to the criteria of VKM No. 22, 12.01.2018. One of the main criteria for the certification of "agritourism subject" is that they must have accommodation capacities from 6-30 rooms.

The profit tax will be reduced from 15% to 5%. This change will come into effect from January 1, 2019 for taxpayers certified as "agritourism subject".

3.4 Other incentives

Law no. 93/2015, dated 27.07.2015 "On tourism", in its Chapter 6 provides for a number of facilities/ support for investments in areas with priority for tourism development such as: - The provision of state real estate, specifically Article 35 provides for the provision of state real estate (even through the symbolic contract of 1 euro), for a period of up to 99 years;

The Integrated Program for Rural Development (PIZHR) – The 100 villages program aims to coordinate development interventions in the rural area of 100 villages. The integrated approach for rural development will target measurable objectives for the development of the rural space, through a centralized focus (integrated and coordinated programming) of public investments, those of donors and private investments, in the well-defined space of 100 villages, with high potentials for economic and social development, agrotourism and rural tourism, nature and environment as well as cultural heritage.

Central and local investments

Different regions have received grants periodically in:

1. direction of urban waste management: (e.g. Solid Waste Management System in the District of Berat, financed by SECO, period 2019-2021)
2. In support of energy: Accompanying measures within the Program "110KV Ring Line in the South Ship, funded by the World Bank, 2019 onwards
3. BERZH-IPA Tourism Development Program, financed by EBRD, 2019-2021
4. In terms of Water Administration: Mat e Vjose basin management plans, financed by the European Commission, 2017-2020.

Forecast of public investments with internal financing:

1. In terms of flood protection infrastructure: Protection from erosion and flooding from rivers in residential areas and river bed systemization, financed by the Department of Irrigation and Drainage in the districts.
2. Requalification of road axes
3. Bridge Design Study
4. In terms of water and sewage supply
5. Towards Cultural Heritage and Museums
6. Improvement and increase of reception capacities, placement of tourist signage in agrotourism destinations included in the 100 villages project, financed by the Ministry of Tourism and Environment, 2018-2019

The implementation of these investment projects

undoubtedly has a positive effect on the accessibility of tourist attractions between the counties by visitors and tourists, affects the general development, facilitates and improves the standard of living of the residents, the quality of the tourist services offered improves significantly, provides security and guarantee for sustainable development of the regions.

Tourist chain

The tourism sector itself encompasses many supporting actors and a diversity of activities that interact in the functionality of the tourism value chain to enable an unforgettable experience for visitors and tourists while creating at the same time increased employment opportunities for local residents and residents. field businesses. Schematically, the presentation of the tourist chain system is presented in the following diagram:

In this context, the tourism value chain represents products and services that are purchased by tourists before traveling or during their stay at the destination. It summarizes:

- Organization and purchase of travel
- Transportation and accessibility
- Accommodation and Food
- Crafts
- Attractions, tours and tourist activities
- Support services

Evaluation of the tourist chain

The tourism chain for Albania is judged at a good level where some of the elements are very well organized, while there is a need for improvements and better achievements in other elements of the tourism chain.

Organization and purchase of travel

Albania as a destination is presented in a very professional manner and has visibility on well-known platforms of local and international tourist operators with various information related to cultural values, spiritual heritage and welcoming tradition, 4the rich natural offer that favors the performance of numerous activities in nature by stimulate adventure tourism and ecotourism. The promotion of the destination on the online pages by tour operators and different agencies of the country is in dignified parameters. Those interested find accessible information related to tourist products offered in accordance with the motives and segmented tourist market. The main hotels and restaurants have visibility on online platforms, enabling bookings and reservations directly online. The information is transmitted in foreign languages besides the mother tongue. Information on the promotion of attractions is accurate and clearly structured. There are evaluations of the experiences lived by visitors/tourists, in addition to different options depending on the tourist products for the duration of the route, the value of the product, the types of travel and the means, gastronomy, as well as the booking possibilities. The possibility of free internet coverage in the premises of tourist services.

Transportation and Availability

The possibility of reaching urban destinations and attractions is considered good. Interurban connections are pleasant through the public transport line that has significant frequency. At the same time, the presence of taxis facilitates communication. They are mainly organized in service companies that operate according to demand and are connected to hotels or tour operators. They are at the service of local residents or visitors to the cities. The ability to communicate in a foreign language is positively evaluated by the drivers of the vehicles that offer this service. The road infrastructure is relatively improved, however, there is a need for improvements in the segments that connect cities with rural areas, especially where tourist attractions are located.

Accommodation and Food

Accommodation is mainly offered in hotels and renovated traditional houses. These accommodation units are appreciated for their high level of hygiene and cleanliness. Regular structures. Serving staff, friendly, professional and polite. Knowledge of foreign languages is a must for the staff who served. In the absence of quality certification standards, it is found that the quality of the accommodation structures does not comply with the stated standards. It is noted that the structures are not equipped with facilitating services such as ramps, referring to individuals with physical disabilities or the third age of the visitors. The presence of accompanying persons in the lobbies of accommodation units to help tourists with the transportation of personal belongings is considered a necessity to improve the quality of service. Accommodation units in the format of hotels offer additional relaxing and attractive services such as spas, swimming pools, aesthetic centers or souvenir shops that better meet the demand for accommodation, especially for business and MICE travelers. Still some of the accommodation facilities are far from international service standards. Local traditions are offered through food products and traditional drinks produced in local workshops of private businesses that exercise this activity. Friendly and welcoming staff.

Figure 5: The Tourist Chain System

Handicraft

Handicraft is one of the supporting activities of the local economy in different cities of Albania. Thanks to the tradition of the professions of stone and wood carving, embroidery, textile weaving, copper work, carpet work, etc., handicrafts attract the attention of visitors and tourists. This subsector takes on a special importance in the country's economy with the income generation it creates and with the possibility of employing mainly women, strengthening their role in the production of handicraft products. In this way, the handicraft sub-sector with souvenirs and handicraft products plays an important role in the tourist market and within the tourist chain itself. The market of handicraft products manifests limitations and is not extensive, there is no possibility of generation for the creation of new markets. The limited opportunities of artisanal producers to be in contact with new design technologies, the limitation to mastering foreign languages and the lack of opportunity to use marketing techniques for the expansion of the market for the sale of artisanal products, affect the limitation of the market, sale of products and the quality of their production.

Attractions, tours and activities

During the last decade, Albania has become known not only for the values of the cultural heritage and the UNESCO wealth it represents, the historical heritage, archaeological values, the tradition of the rich material and spiritual culture (legends, costume design, known codices, special architecture), but it has become equally sought after thanks to the natural resources it possesses, especially attractive natural beauties such as the Albanian Alps, the canyons of Osum, turning extreme sports activities into adventure tourism. In this way, thanks to its natural attractions, Albania offers very good opportunities for activities such as rafting, canoeing, hiking, trekking, in addition to attractions that stimulate the development of cultural or special interest tourism. The existence of this potential of assets that form a wide offer of types of tourism aims at the fading of seasonality and the development of year-round tourism, in addition to increasing the average length of stay of tourists at the destination.

Support services

The level of provision of support services is considered good. Destination management companies, tourist information centers equipped with the necessary information on cultural and historical heritage as well as natural attractions operate in tourist destinations. Friendly and professional staff. Facilitous services distributed among destinations such as: automatic cash withdrawal units, fuel supply points, parking places, as well as health and emergency services. Based on the development of activities in nature, they have found reawakening and service units of various sports equipment that are used for activities/sports in nature. The situation regarding the management of drinking water is still worrying, since running water is not available 24 hours a day, as well as regarding the management of urban waste and used water.

Interactive actors in the tourism sector

Identification of interacting public and private sector actors

The main actors that interact in the field of tourism have essential importance for the functions,

the design of development policies and strategies, the implementation of products and their development, the stimulation of changes responding to the demands of the tourist market. Based on the legal acts and administrative functions according to the competences referred to the Law on Tourism and the National Strategy for the Development of Sustainable Tourism 2019-2023, the cooperating actors that interact are the primary actors - central and local government institutions at the level of policy makers and action strategies, important actors that influence central and local regulatory and implementing levels, in addition to private organizations and various donors that strongly influence through development projects, as well as the community.

Central government institutions

Ministry responsible for tourism (Ministry of Tourism and Environment), National Tourism Agency (AKT), National Agency of Protected Areas (AKZM), Albanian Investment Development Agency (AIDA).

Other public institutions that influence the development of tourism at the nationaland local level are as follows: Ministry of Culture, Ministry of Education, Youth and Sports, Ministry of Health and Social Protection, Ministry of Interior, Ministry of Infrastructure and Energy, Ministry of Agriculture and Rural Development, Ministry of Finance and Economy, Ministry for Europe and Foreign Affairs, Bank of Albania, Institute of Statistics, Institute of Cultural Monuments, Archaeological Service Agency, Institute of Popular Culture, National Agency for Regional Development, Regional Economic Development Agency, Private Tourism Sector Advisory Committee, Local Government Bodies and Responsibilities theirs in relation to tourism, Regional Directorates of National Culture, Institutions that provide public services, Institutions of Higher Education, municipalities, information center for toursit etc.

Private businesses that operate in the field of tourism services, in the accommodation sector, F&B, local producers related to the production of gastronomy products, artisans, business leaders that enable the performance of recreational activities in nature or built attractions.

Private Organizations and Institutions that influence the rate of tourism development in the regions: Associations of the Private Tourism Sector, International Donors with an active role in the tourism sector, UNDP, CHWB, ADF, GIZ, World Bank, RISI Albania, CESVI, Pro Përmet Consortium, Gjirokastra Foundation, etc.

Progress of tourist products according to the actors operating in the tourism industry and the vision regarding the perspective of the tourist product of the area

In today's competitive tourism market, destinations must offer a number of activities and services to be successful. They include:

- Best practices that have created positive experiences among target market visitors (visitor experiences that are unique and respond to market expectations better than the competition)
- Exceptional services provided to the client
- Quality experiences that are easily planable, accessible and affordable
- A good Price
- Meeting and exceeding customer expectations
- Providing contemporary products that meet the standards
- Infrastructure and services needed to support the experiences offered

The primary products are those that carry the weight of tourism development, relying on the best potentials presented by the tourist offer according to the areas, which in themselves constitute the main motives of visits to the destination, and on this basis the management of the destinations must have the focus of the activity is precisely the improvement of these products since they have a development base and an elevated image. Undoubtedly, secondary products complement and enrich the offer in the region as part of the existing resources. They should be developed in the medium and long-term plans and return to reasons for visiting motives as well, becoming part of the active offer of the area, since the positive image among visitors/tourists as a pleasant experience has already been created.

Albania is trying to position itself as one of the most attractive tourist regions in the Balkans and even in Europe by offering unique products and trying to diversify the offer, as more and more tourism is seen as a promoter of the development of the country's economy and the local economy. to destinations, in particular, as an income generator and promoter of the protection and sustainable development of environmental and human resources.

The cooperation between the actor partners, businesses, organizations, to manage the product, and market it in the target market, convince consumers and make sales guarantee the success of the destination products in the tourist market.

Recomendations

1. The diversification of the portfolio of tourism products for Albania will bring a positive impact on the increase in tourist attendance, and the fading of seasonality. 2. The further professional development of tourist products, the comprehensive inclusion of different types of attractions and tourist resources within a package will aim for the greatest attractiveness of international and domestic visitors, and even the number of overnight stays will be expected to be greater. .

3. Together with the development of the products, it will be aimed to improve and diversify the offer of hospitality accommodation structures, aiming towards the fulfillment of the sector's standards, and the standardization of the existing ones. 4. The promotion of gastronomy through traditional biological products and unique recipes according to regions together with the development of artisanal workshops that produce typical products is promoted and distributed closer to consumers through the establishment of Eco Museum initiatives within the workshops themselves, influencing the enrichment of the region's attractions in the same time.

5. Diversification of the tourist offer through new attractions and added activities, improvement of the interpretation of natural and cultural heritage values, improvement of the quality of hospitality structures, simultaneously with the increase in the number of visitors staying in the destination will affect the growth of the income of the local economy.

6. Through better promotion, strengthening the image of the destination, improving the tourist offer and the quality of services, the number of visitors to the destination will manifest a positive growth trend in the long term. 7. Improving the quality of the product portfolio, improving infrastructure and accessibility as well as creating interregional products will enable the presence and profile of individual visitors alongside existing groups.

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– Web site të konsultuara: www.blue-albania.com www.albrafting.org www.caravanhorseriding.org www.freskiavirua.com www.slowfood.com www.terramadre.info www.discoveralbanianow.com www.al.undp.org www.wttc.org

Territory Analysis – Tehnopolis, Montenegro

Context

Tourism suffered the greatest crisis on record in 2020. According to UNWTO international arrivals plunged by 73% as the COVID-19 pandemic prompted nearly all governments around the world to introduce a range of measures to restrict travel, including border closures to tourists. One billion fewer Tourism suffered the greatest crisis on record in 2020. According to UNWTO international arrivals plunged by 73% as the COVID-19 pandemic prompted nearly all governments around the world to introduce a range of measures to restrict travel, including border closures to tourists. One billion fewer international tourist arrivals for the year translates into an estimated loss of nearly $1.1 trillion in worldwide exports and over $2 trillion in direct tourism gross domestic product (GDP), more than 2% of the world's GDP. The pandemic has also put more than 100 million direct tourism jobs at risk, with women, youth, and micro, small, and medium-sized enterprises being the most vulnerable. At the same time, the pandemic allows a rethink of the structure of the tourism sector to increase its alignment with environmental and other public policy requirements. As tourism destinations gradually reopen and policies aim to spur a sustainable recovery. (1)

The principles of sustainability relate to the natural, economic and socio-cultural aspects of tourism development, and the appropriate balance must be established between these three dimensions in order to guarantee its long-term sustainability.

UNWTO foresees growth of the tourism industry and its associated tendency to overcrowd a destination progresses in tandem with strong environmental sentiments from consumers who increasingly demand cleaner, more sustainable and more environmentally friendly tourism destinations. Development of the biodiversity-based tourism products should aim at long-term sustainable development, promote social integration and increase the income of the tourism sector and that of the local community.

Since oceans cover more than 70% of the Earth's surface and are home to 94% of all life it's evident how vital marine environments are to the planet. Man has explored less than 5% of the Earth's oceans. As researchers strive to discover more, we're continually getting to know our oceans better. According to the World Register of Marine Species, there are now 240,470 accepted species, but this is believed to be just a small proportion of the species that exist, with new marine life being discovered every day.

The Adriatic Sea is one of the major global tourist destinations with rich but threatened biodiversity. Within the Adriatic Sea, there is The Boka Kotorska Bay, protected by UNESCO from 1979 as a cultural and natural heritage, with a coastline of about 100km, looking like a fjord and representing habitat for bottlenose dolphins.

This study is developed within BioTours (Biodiversity and Tourism Strategy to protect cetaceans) project with the aim to present the possibilities of developing sustainable tourism in the field of dolphin observation and conservation in Montenegro. The study refers to science tourism development based on dolphin observation, including good practice examples in dolphin conservation and sustainability.

The conducted research includes data on sustainable tourism, biodiversity, dolphin conservation methodologies, challenges and recommendation for the future.

Sustainable tourism – a requirement for survival

As a result of intense and chaotic development, many tourist destinations face a growing pressure on their natural, cultural and socio-economic environment. It is now acknowledged that uncontrolled growth of tourism, which aim is short-term economic benefit, results in many negative impacts, disturbance of the environment and culture of local communities, destroying the foundations on which its development is based.

The contribution of tourism to overall sustainable development is enormous and requires a special treatment of this activity. On the one hand, this is due to the volume and dynamics of growth and economic effects that affect the economies of many countries and the living standard of the population. On the other hand, the character of tourism involves multiple and specific links between visitors, the environment, service providers and the local community, the integration of various economic and non-commercial activities, public institutions and social organizations. In this context, three important aspects of these relationships should be considered: interaction, awareness and dependence, as the premise of sustainable development. Therefore, tourism is also necessary for sustainable development.

The principles of sustainability relate to the natural, economic and socio-cultural aspects of tourism development, and the appropriate balance must be established between these three dimensions in order to guarantee its long-term sustainability. Therefore, sustainable tourism should:

• Make optimal use of natural resources which are the key element of tourism development, maintaining important ecological processes and preserving natural heritage and biodiversity; Respect the socio-cultural authenticity of the local community, protect their built and modern cultural heritage and traditional values and contributes to understanding and tolerance between cultures;

• Provide sustainable long-term business, generating socio-economic benefits that are fairly distributed to all stakeholders, including stable employment, income-generating opportunities and social care for local communities, as well as contributing to poverty reduction.

Tourism represents a major source of export revenues for many countries, and an important part of their GDP. The sector supports millions of direct and indirect jobs all over the world, particularly for women and young people. According to the UNWTO (United Nations World Tourism Organization) contribution of tourism to the world economy amounted to USD 3.5 trillion in 2019, or 4% of world GDP, measured in tourism direct gross domestic product (TDGDP).

In 2020-21, the COVID-19 pandemic caused an unprecedented disruption to tourism, resulting in a massive drop in international travel following a global lockdown and plunge in demand amid widespread travel restrictions put in place to contain the spread of the coronavirus. Tourism was the most affected sector by the COVID-19 pandemic, with businesses, employment and livelihoods around the world severely impacted by the crisis. The UNWTO's Economic contribution of tourism and the impact of Covid-19 report shows that tourism was the most affected sector by the COVID-19 pandemic, with businesses, employment and livelihoods around the world severely impacted by the crisis. The UNWTO key findings:

• The COVID-19 pandemic cut tourism direct GDP by more than half in 2020, reducing it by USD 2.0 trillion, to 1.8% of world GDP;

• International tourist arrivals dropped by 73% in 2020;

• TDGDP is expected to edge up to 2% of world GDP in 2021, following a rebound in domestic tourism and higher spending on both domestic and international travel.

Strategic framework for development of sustainable tourism in Montenegro

The new Tourism Development Strategy of Montenegro 2021-2025. with the Action Plan is drafted within the Working group at Ministry of economic development (since the previous one has expired in 2020). The new strategy will be an umbrella strategic document, which will define the vision of further development of tourism, considering the principles of sustainability, development needs and potentials of tourism in Montenegro. Tourism Development Strategy of Montenegro for the period 2021-2025. should provide an answer to the question of what kind of tourism Montenegro wants and should develop, and what key activities of tourism policy should be aimed for improving the competitiveness of Montenegrin tourism while respecting the principles of sustainable development.

The National Strategy for Sustainable Development until 2030 is the umbrella, horizontal, and long term development strategy of Montenegro, which refers not only to the environment and economy, but also to human resources and social capital that should enable prosperous development of Montenegro. Project activities in the tourism sector are based primarily on respect for the principles of sustainability defined by the National Strategy for Sustainable Development of Montenegro until 2030.

As one of the priorities in the overall development of the Montenegrin economy, tourism is recognized in the development documents of the Government of Montenegro, in the following documents:

Development directions of Montenegro 2018-2021. Tourism is one of four priority sectors of development.

Economic Reform Program for Montenegro 2020-2022 is the most important document of Montenegro in the economic dialogue with the European Union and a key strategic document of the country for medium-term macroeconomic and fiscal programming. Tourism is recognized as a priority reform measure 5: Diversification of the tourist product (measure "Sustainable tourism in the new reality")

Smart specialization strategy 2019-2024. Based on the strategic vision of the development of Montenegro, applying the s3 methodology and implementing the process of entrepreneurial discovery, five priority economic areas have been defined, namely: renewable energy sources and energy efficiency, sustainable agriculture and food value chain, new materials and sustainable technologies, sustainable and health tourism and ICT.

Sustainable tourism and biodiversity conservation

Biodiversity means the diversity of living organisms that inhabit land and water, as well as diversity within different species, between species and ecosystems. Biodiversity is not only the overall diversity of forms and phenomena of flora and fauna, but also diversity of functions of living organisms. For the survival of our planet and the harmonious coexistence of human and nature, the world should focus on two main goals: conservation and sustainable use of biodiversity.

Biodiversity conservation is the conservation and restoration of damaged ecosystems and natural habitats, as and the conservation and recovery of plant and animal species. Sustainable use is the use of components biodiversity that does not cause disruption of biodiversity, but represents rational use of natural resources and maintaining the level of biodiversity potential that meets the needs and aspirations of present and future generations. Biodiversity conservation implies strategies at the local, national level and globally, based on environmental, social and ethical foundations. For that reason, it is necessary to:

- raise the level of research (inventory, identification, etc.);
- conduct regular monitoring of the state of biodiversity;
- rational use of biological resources;
- preserve and restore damaged ecosystems and habitats;
- have sustainable management of protected areas;
- establish red lists of rare and endangered species;
- implement international agreements and legal provisions regulating issues of biodiversity conservation and protection;
- educate and raise awareness of the population.[(2)]

As UNWTO foresees continued growth of the tourism industry and its associated tendency to overcrowd a destination progresses in tandem with strong environmental sentiments from consumers who increasingly demand cleaner, more sustainable and more environmentally friendly tourism destinations. These qualitative and quantitative trends necessitate the development and management of sustainable and biodiversity-based tourism products, linking tourism with the sustainable use of natural resources and conservation management. The development of biodiversity-based tourism products should aim at long-term sustainable development, promote social integration and increase the income of the tourism sector and that of the local community. It should be based on a comprehensive action plan that focuses on product diversification, competitiveness and community-based development that emphasizes biodiversity protection and management, culture, heritage and sustainable tourism. [(2)]

According to the UNWTO and the Convention on Biological Diversity (CBD), sustainable tourism should contribute to the conservation of biodiversity and culture; to the well-being of the local communities and indigenous people; involve responsible action on the part of the tourist and tourism industry; be appropriate in scale; require the lowest possible consumption of non-renewable resources; respect physical and social carrying capacities; involve minimal repatriation of earned revenue; be locally owned and operate through local participation, ownership and business opportunities.

EU coastal and marine policy

Since the early 1970s, Europe has been firmly committed to environment protection. Air and water quality, conservation of resources, biodiversity protection, waste management and control of activities with adverse environmental impact are just some of the areas in which the EU is active, at both Member State level and the union level. European environment policy, based on Article 174 of the Treaty establishing the European Community, seeks to ensure the sustainable development of the European model of society. Here below are some EU directives regarding environment and marine issues.

- The Habitats Directive on the conservation of natural habitats and of wild fauna and flora. The habitats directive is basis for the development of the Natura 2000 network throughout the member states and accession countries.
- Environmental Impact Assessment Directive on the assessment of the effects of certain public and private projects on the environment.
- Water Framework Directive establishing a framework for Community action in the field of water policy and integrated river basin management for Europe.
- Strategic Environmental Assessment Directive on the assessment of the effects of certain plans and programmes on the environment.
- Environmental Liability Directive on environmental liability with regard to the prevention and remedying of environmental damage.
- Maritime Spatial Planning Framework Directive
- Marine Strategy Framework Directive on establishing a framework for community action in the field of marine environmental policy which will be presented briefly in the following text.

Figure 1: Illustration of the Marine Strategy Framework Directive

European Union's Marine Strategy Framework Directive aim is to protect more effectively the marine environment across Europe. The Marine Strategy Framework Directive was adopted on 17 June 2008. The Commission also produced a set of detailed criteria and methodological standards to help Member States implement the Marine Strategy Framework Directive. These were revised in 2017 leading to the new Commission Decision on Good Environmental Status. Annex III of the Directive was also amended in 2017 to better link ecosystem components, anthropogenic pressures and impacts on the marine environment with the MSFD's 11 descriptors and with the new Decision on Good Environmental Status. [(4)]

The Commission adopted a report on the first implementation cycle of the Marine Strategy Framework Directive in June 2020 (Figure 1). This report, required by Article 20 of the Directive shows that while the EU's framework for marine environmental protection is one of the most comprehensive and ambitious worldwide, it needs to be beefed up to be able to tackle predominant pressures such as overfishing and unsustainable fishing practices, plastic litter, excess nutrients, underwater noise and others types of pollution. [(5)] Even though The Directive has provided better understanding of the pressures and impacts of human activities on the sea, and their implications for marine biodiversity, their habitats, and the ecosystems they sustain, there is still room for improvement. The knowledge gained from implementing this Directive was for example a driving force leading to the adoption of the Single use Plastics Directive. It has led to increased cooperation among littoral Member States of the four Eu-

ropean sea regions, as well as across marine regions. As a result, non-EU Member States also aim to achieve good environmental status or its equivalent. Still, EU Member States could further improve their coordination, namely in determining the coordinated objectives and targets and having effective measures tackling the right pressures. (6)

Dolphin conservation – example of good practice

As a good example on dolphin conservation connecting science and tourism on EU territory we chose The Blue World Institute in Croatia. The Blue World Institute of Marine Research and Conservation was founded in 1999 by a group of 10 members, all previously involved in the Adriatic Dolphin Project. This independent non-profit organisation was set up with the intention to carry out scientific research and conservation of the marine environment as well as educational activities, with an emphasis on the Adriatic Sea and the wider Mediterranean basin. Their three main programmes – research, education and conservation – provide a framework for executing multiple projects aimed at furthering the understanding of the marine environment, its flagships species, and public participation in their protection. With partner organizations in Montenegro, Italy and Albania, The Institute conducted several survey programs, aerial surveys in the whole Adriatic Sea in 2010 and 2013 and the results of these surveys present the first ever data on distribution and abundance of cetaceans, sea turtles and giant devil rays in the Adriatic and are setting the reference point for a regular monitoring programme. (7)

Besides research, The Blue World Institute has also an educational programme for delivering accurate and evidence-based knowledge on the state and status of the marine environment, endangered species and assisting conservation efforts. Educational programme includes programme for kindergartens and schools, marine education centre and marine science museum to be opened in the future. The scope of work in conservation is widen through partnership with many organizations, projects and educational activities.

Dolphin conservation at Blue World Institute

It is emphasized that there is a fine line between enjoying dolphin watching, with minimal or no impact on their behaviour, and causing severe disturbance while chasing them around. It is all too easy to step over this line if you are not careful and observant. Like humans, dolphins exhibit various natural behaviours throughout the day. They all serve a particular purpose and contribute to the overall health and survival of individuals within a group. These include feeding, travelling, resting, maternal care, social interactions and others. Having this in mind, it is clear that by approaching dolphins in the wild, we are creating a disturbance in their routine. To a certain extent, we are forcing them to abandon their current activities to deal with our presence. Persistent disturbance may cause long-term negative impacts such as stress related health issues, reduced reproductive success or avoidance of previously very important areas. What we choose to do when we encounter dolphins is going to make a huge difference to their well-being. (8)

In order to avoid the negative impacts, there is a set of rules (Figure 2) that need to be followed when observing the dolphins.

Besides the code of conduct there are some important issues that should be taken into consideration very carefully when observing the dolphins according to The Blue World Institute:

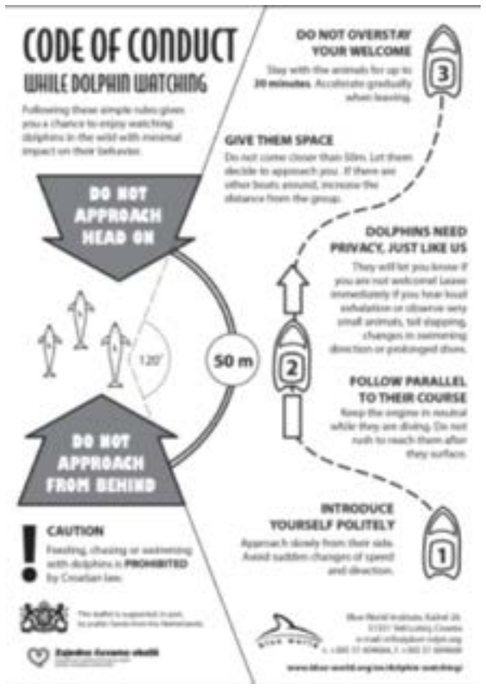

Figure 2: Code of conduct while dolphin watching - Source: Blue World Institute

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· Do not swim or dive with the dolphins. There is a risk of harassing the animals while trying to position the boat in such a way that would enable a person to dive close to the group. Dolphins can move through water much faster than any swimmer so chasing them around is not going to give a chance for a closer look. Situation is not safe for people or the dolphins. These are wild, untrained animals with unpredictable behaviour and should be treated with care and respect. People need medical attention due to bites and body strikes inflicted during such interactions. While people in the water may become objects of interest for nearby dolphins, their curiosity should not be misinterpreted as friendly behaviour. By trying to seek out their attention, swimmer is disrupting their natural behaviour and forcing them to abandon their current activities such as resting, feeding and socialising. The repeated presence of people in the water can also have the effect of decreasing fear of human interaction making them more vulnerable to boat strikes, entanglement in fishing gear or even intentional harassment. Both humans and dolphins are mammals. Although sea water acts as an effective disinfectant, interaction with wild dolphins may result in disease transfer. These may present serious health threats to dolphins and humans alike.

Finally, swimming with dolphins represents harassment.

• Do not feed the dolphins. Many people lose track of the fact that dolphins rely on their hunting skills to survive as predators in the wild, and offer them food. Most believe they are helping "starving" dolphins by providing an easy meal. Some are trying to trick the dolphins into coming closer in hope of prolonging the encounter. While these are probably not the only reasons behind this kind of conduct, the results are always adverse. This is why:

o Dolphins can get accustomed to receiving food and become increasingly dependent on humans to provide the next meal.

o The adopted habit of looking for food near humans can prove to be fatal to offspring that may not learn essential hunting and foraging skills. These individuals become completely dependent on human intervention to survive.

o Animals used to receive food will often accept items they would normally refuse to eat. Ingestion of inappropriate food items such as candy bars, pretzels or even plastic objects that are sometimes offered by people who are unaware or unethical can lead to serious health problems.

– Even if people provide fish or other marine organisms such as squid, bear in mind the species in question may not be part of the natural diet of dolphins. These can be contaminated by bacteria and become a source of, potentially lethal, infection if improperly handled or stored.

– Dolphins accustomed to taking food from people lose their fear of humans and frequently approach boats. Being less cautious places them at greater risk of entanglement in fishing gear or ingestion of deployed equipment.

– Dolphins used to receive food from humans can become aggressive if you fail to produce the expected hand out or try to touch and tease them. These are wild animals with unpredictable behaviour.

– Feeding dolphins in the wild constitutes harming and harassment for reasons explained above.

The major scientific research interest of the Blue World Institute is the study of common bottlenose dolphins (Tursiops truncatus) in the Adriatic Sea, implemented through the Adriatic Dolphin Project (ADP) (Picture 1). Initiated in 1987, the ADP is now the longest ongoing study of a bottlenose dolphin population in the Mediterranean Sea and one of the longest in the world. It is recognised as an example for best practice, reflected in the international cooperation it has created. Over the years The Blue World Institute is using a wide spectrum of research methods to increase scientific knowledge on the ecology of the Adriatic marine environment, and on the anthropogenic impact on ocean health.

Some of the research methods used by The Blue World Institute in order to increase scientific knowledge on the ecology of the Adriatic marine environment, and on the anthropogenic impact on ocean health are listed below.

Aerial Survey - two aerial surveys carried out on the distribution and abundance of bottlenose dolphins (Tursiops truncatus) and other species of conservation interest in the entire Adriatic Sea. These surveys provided the first complete aerial survey data at the basin level on the distribution and abundance of these species.

Behaviour - understanding dolphins' behaviour is important in order to understand habitat use, po-

pulation health and threats, etc. The goal is to understand the amount of time an individual spends doing one activity, creating a "behavioural budget" for an individual or group. Some activities aim at researching changes in the behaviour of individual dolphins in the vicinity of different vessels.

Figure 3: Research Adriatic Dolphin Project Source: Blue World Institute

Bio Acoustics - research of the impact of underwater noise (sound pollution) on dolphins and their habitat through the application of passive bioacoustics. At great depths, where visibility is reduced, dolphins rely on their hearing to understand their environment. Over time, they have evolved a highly sophisticated system of sound production and reception called echolocation, which is used for communication, prey detection, locating potential threats, orientation and navigation.

Diet - analysing the partially digested stomach contents of dead dolphins in order to identify their prey. Bottlenose dolphins are generally opportunistic feeders consuming fish and cephalopods (e.g., squid). The analysis detects the presence of the beaks of cephalopods and fish sagittal otolith (ear bones). Continuous monitoring of feeding habits is important because any shift in preference prey species could imply changes, not just in fish stocks, but also increasing competition with fishery in the area.

Figure 4: Source: https://www.blue-world.org/

Genetics - understanding the genetic population structure in cetaceans provides insight into their biology and behaviour over both the long-term evolutionary and short-time scale. Such knowledge is important for conservation and management strategies because, while bottlenose dolphin enjoy a wide distribution at species level, there are survival challenges at population and group levels.

Location-Tracking - supplements the photography and identification of the animals by recording the locations of sightings of groups and individual dolphins; it allows investigating the many different habitat uses.

Photo-identification - commonly used research tool used to identify individual dolphins and other animals. The camera "captures" an image of the animal whenever it is sighted, based on the amount of times it is "captured" a statistical method called "mark – recapture" is used to estimate the size of the population in a defined area. During an encounter with dolphins, researchers photograph marks (such as cuts or scars) on the back of the animals.

Figure 5: Source: https://www.blue-world.org/

The Blue World Institute has created several programmes and possibilities for interested citizens and tourist to get involved and participate in scientific activities to advance conservation. One of them is **Citizen science programme** which includes: [9]

Marine Partnership Application

Every time you are out at sea –diving, surfing, sailing, or even swimming – you might encounter a whale, a dolphin, a sea turtle or experience another event worthy of noting for conservation purposes. Report your sighting by filling in our form or report your sightings using our Marine Partnership mobile application for iOS and Android. The Blue World Institute has created a mobile device application with the purpose to expand the information available about marine species in the Adriatic by increasing public participation in science-based data collection.

Report a Sighting

Every time you are out at sea – diving, surfing, sailing, or even swimming – you might encounter a whale, a dolphin, a sea turtle or experience another event worthy of noting for conservation purposes. With help from members of the public and seafarers we can identify the spreading of alien species or quickly identify emerging environmental issues. It would help us a lot if you would share the information about these sightings with us. Please complete the form below and click send. You do not have to send all details but the fields marked with asterisk are necessary for a useable form. This information will be added to our growing database and will help us better conduct our marine protection work. Sometimes identification of species is tricky, especially when there are first-time reports. To confirm such reports we kindly ask you to add a photo or a short video, or add a link to allow us to download it. Contact info@blue-world.org if you have any questions or need assistance in completing the form.

Tourism and biodiversity in Montenegro

Biodiversity is vital for tourism. Coasts, mountains, rivers and forests are major attractions for tourists around the world. Tourism in the Caribbean, Mediterranean and much of Southeast Asia depends strongly on the recreational opportunities provided by their coastal environments. Biodiversity plays different roles in different types of tourism. All tourism – even in city centres – relies on natural resources for supplies of food, clean water and other 'ecosystem services' that ultimately depend on biodiversity. For most other types of tourism, biodiversity contributes significantly to the attractiveness and quality of destinations, and therefore to their competitiveness: for example, coastal water quality and natural vegetation are both ecosystem services that contribute to destination attractiveness. And biodiversity is a direct attraction at the heart of nature-based tourism products – such as wildlife watching, scuba diving or tourism in protected areas. [10]

However, biodiversity is under pressure worldwide and has suffered severe losses as more land is converted for human use from a natural state, and as these human uses become more intensive. In 2005, the UN's Millennium Ecosystem Assessment concluded that human activities threatened the Earth's ability to sustain future generations. [11]

Tourism is the main economic activity in Montenegro and contributes almost 25% of the total GDP. Over 90% of total tourism turnover is recorded on the coastal part of Montenegro. Area of Montenegro is 13.812 km² with population of 625.000 inhabitants. The length of the coast is 293 km and beaches 72 km. The highest mountain peak is 2.525 m. Climate varies from Mediterranean to continental. Montenegro has very favourable weather conditions. Average air temperature in the summer is 27.4 ºC. Maximum sea temperature is 27.1 º C. Average number of sunny days during the year is 240. Swimming season lasts for 180 days. Montenegro has five national parks: Biogradska Gora, Durmitor, Lovcen, Skadar lake, Prokletije. Bay of Kotor, similar to a fjord, it is surrounded by mountains up to 1000m, which descend almost steeply into the sea.

In September 1991, Parliament of Montenegro declared Montenegro an ecological state, expressing a close connection between human and nature and calling for the protection of land and nature. The current Constitution reflects important elements of this Declaration and in this supreme legal act Montenegro was declared as an ecological state.

One of the main areas covered by the Acquis the communautaire of the European Union is the environment and use of natural resources. It is considered that one of the most important steps in the EU integration process is the adoption of appropriate regulations and standards in this area. European environment protection practice is an effective way forimprovement and preservation in order to fulfil a basic human right, the right to healthy environment. European norms and standards need to be implemented not just because of the conditions of EU membership, but also because of the essential right to a quality environment.

Even if there is no formal ecosystem classification in Montenegro, broadly recognized classification, from the biodiversity conservation stand point in the National Strategy of Biodiversity with Action Plan are the following ecosystems: mountain, forest, grassy, freshwater, marine, coastal, karst, cave

and canyon. Habitats are inhabited by crowd's species from almost all systematic categories. Within its coverage, 54% is covered by forests while natural forests cover 45% of the territory. Currently, protected areas cover 12% of the territories with a total of 73 protected areas of which the largest part (101,733 ha or 7.32%) are 5 national parks. The rest of protected areas refers to: nature parks (5), strict nature reserves (3), special nature reserve (1), nature monument (57), a region of outstanding features (2).

Since 1979 The Bay of Kotor and Risan (15,000 ha) is on the UNESCO World List heritage and it is subject of international protected area.

The coastal area of Montenegro is characterized by a series specific and diverse habitats and animal community. A review of available literature data can be concluded that the coastal area of Montenegro is inhabited by 1540 plant species, 113 lichens, 283 mosses, 232 fungi, 289 invertebrates, 29 representatives of ichthyofauna, 18 amphibians, 38 reptiles, 249 birds and 69 mammals. The Montenegrin sea zone covers area of 12 nautical miles (22,26 km) from the coast, covers 2.504,8 km2 and reaches a maximum depth of 1.233 meters. [(12)]

Impacts of tourism on biodiversity

Tourism has positive and negative impacts for biodiversity. It can be a way of protecting areas from other more detrimental forms of development and of providing an economic basis for investments in conservation and ecosystem restoration, and for generating local employment in areas where there are few other employment options: the value of national parks for tourism and the development of private game parks in South Africa are examples. Tourism also has serious negative effects on the environment arising from land conversion for tourism, inappropriate siting of tourism, pollution and wastes, overexploitation of natural resources, and disturbance of wildlife. It can also create negative social impacts linked to conflicts over resource use, clashes between tourists and local cultural norms and values, or associated with working conditions and opportunities for local people to work in tourism businesses. [(13)]

Tourism, produces an impact on the environment, even at low levels of intensity and despite the best management of protected areas. Such influences also occur at the level locations and in larger areas. Ecological risks from tourism are: construction of accommodation, visitor centres, infrastructure development, vegetation removal, habitat and species loss, impact on drainage, etc. Habitats can change significantly with the construction of roads, the establishment of hunting reserves, by establishing cultivation areas, removing trees and acting on erosion. Transportation may have direct negative effects on the environment (eg removal of vegetation, transfer of weeds, disturbance of animals). Tourism in protected areas creates space for neglecting those protected areas that have important conservation values but limited attraction for tourists. Ecotourism / sustainable tourism strategies should be based on strengthening the positive benefits and reducing the negative impact on environment before they occur. This is best achieved through well-designed planning strategies. Each protected area should have a plan that envisages how the tourism and development of that area will be managed. The plan should describe in detail the specific goals and objectives defined by the regulations in the field of nature protection.

Measures for biodiversity protection in the field of tourism:

· increasing the share of tourism revenues that will be used for environmental protection and biodiversity measures;

· improving water saving measures in the coastal area in order to reduce the need to obtain water from the lake;

· improving the implementation and enforcement of measures to mitigate the negative impacts of tourism on biodiversity in the sea. [(14)]

Protection of coastal and marine area in Montenegro

The Montenegrin coast includes two significantly different areas by geographical and hydrographic oceanographic characteristics: Bay of Kotor and open sea in front of the coastline. The total area of the sea is 6.347 km2 and the territorial sea about 2.100 km2 (of which 89 km2 in the Bay of Kotor). The coastal area in whole, and especially the narrower coastal area, with its natural, cultural and landscape values, is a key development resource of Montenegro. At the same time, the pressure of urbanization, especially real estate construction and hospitality facilities, result in numerous examples of endangering environment, as well as natural, landscape and cultural resources, which represents the most significant threat to the sustainable development of the coastal area. Except the anthropogenic impact, additional pressure on the resources of the land and sea makes the climate change. The marine ecosystem is exposed to numerous and diverse pressures which, above all, include the effects of pollution from untreated utility wastewater, solid waste, shipbuilding / ship repair, from port and marina. [(15)]

Vulnerability analysis (results from the Monitoring Program of the coastal sea area ecosystem of Montenegro, conducted in the period from 2008 to 2011) showed a very high vulnerability of the sea in the Bay of Kotor (Figure 6).

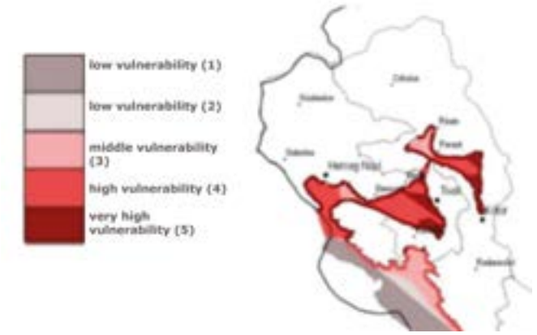

Figure 6: Showcasing the total vulnerability of the sea in the Bay of Kotor, Source: National strategy of integral management of the coastal area in Montenegro

The following areas are recognized as extremely vulnerable: the most indented part of the Bay of Kotor, the part in between Shipbuilding in Bijela and the port of Porto Montenegro, the area around the island of Sveti Marko in the Bay of Tivat, part of the Herceg Novi Bay from Igalo to Mamula (Figure 7). Generally, at the narrow coastal area of the open sea and the Bay of Kotor are very vulnerable to pollution from eventual accidents at the sea.

Water and sediment pollution are especially present in the immediate vicinity of Shipbuilding in Bijela and the narrow coverage of the location of the former Overhaul Institute "Arsenal" in Tivat where high concentrations of heavy metals and organic metals have been recorded as pollutants. The level of pollution in the open sea is lower due to the relatively large depth and good mixing of the waters. Communal wastewater is a major source of marine pollution throughout the coastal area.

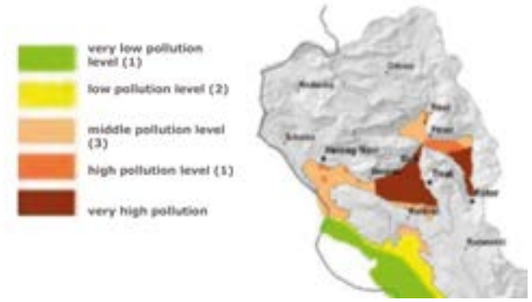

Figure 7: Total pollution / endangerment of the sea in the Bay of Kotor (maximum value). Source: National strategy of integral management of the coastal area in Montenegro

Legal framework regarding biodiversity and marine area in Montenegro

There is a set of laws and other legal instruments governing biodiversity protection and use of coastal area. We point out some of the most important and relevant as follows:

1. Law on Environment ("Official Gazette of Montenegro", no. 52/16), which regulates the principles of environment protection and sustainable development, instruments and environmental protection measures as well as other issues of importance for the environment;

2. Law on Nature Protection ("Official Gazette of Montenegro", no. 54/16) regulates the conditions and modes of protection and nature conservation and is the primary regulation in this sub-area. Transposes habitat directives and wild birds and the CITES Regulation;

3. Law on National Parks ("Official Gazette of Montenegro", no. 28/14, 39/16) which defines protection, promotion and development of national parks;

4. Law on Animal Welfare protection ("Official Gazette of Montenegro", no. 14/08, 40/11, 47/15) which regulates obligations and responsibilities of legal and personal entities for the protection of the welfare of animals they are holding for production, keeping them away from unnecessary pain, suffering or injury, protection in killing, slaughter and transportation, when performing procedures on animals and conducting experiments, as well as other questions from importance for animal welfare;

5. Law on the protection of the marine environment ("Official Gazette of Montenegro", no. 073/19) refers to protection, conservation, sanation and valorization of marine ecosystem i biodi-

versity protection and other important issues regarding protection of marine enivronment.
Besides the above mentioned, there are several laws that regulate the issues of proclamation and management of protected areas such as: Law on Spatial Planning, the Law on Forests, the Law on Environmental impact assessment, Law on Strategic impact assessment of environment, Law on Responsibility for Environmental Damage, Law on the Sea, Law on Maritime Property, Law on Marine Fisheries and Mariculture, Law on Marine Protection from pollution from vessels, etc.
The organization of the institutional system in Montenegro indicates that special importance is given to the coastal area. The area of marine property, as the most important part of the coastal area, since 1992. managed by the Public Enterprise for the management of marine assets. A large number of departments, state administration bodies, institutions and bodies of local authorities have competencies for improvement of coastal zone management of Montenegro.
Many documents define and treat the coastal area from the aspect of its protection and use. One of the crucial ones is the Special Purpose Spatial Plan for Coastal Area of Montenegro. The SPSP for the Coastal Area of Montenegro defines the mode of organizations and regimes of use of the coastal region. The plan provides rational use of space and drives significant economic development. Coordinated activities from the local level to the state, which is a prerequisite for achieving strategic development priorities of Montenegro. Special attention in the Plan is given to the narrower coastal area which is protected in accordance with the Protocol of the Barcelona Convention. The purpose is to connect the narrower coastal areas with natural hinterland. The Plan identifies the area marked as a maritime asset and its integral part, among other things, the sea (territorial and internal sea waters - except Skadar Lake), limited to the mainland from the coastline to the line where the highest waves are reaching during the strongest weather (SPSP for the Coastal Area of Montenegro, 2018).

Boka Kotorska Bay - dolphin habitat

Through many research works, Boka Kotorska Bay has been recognized as a natural habitat for marine mammals, including dolphins. Research works and field research on this topic have gained momentum only relatively recently. The first workshops were part of international projects dealing with environmental protection. The first such project, which was conducted from October 2012 to September 2015 - NETCET project, “Natural and cultural resources and risk prevention”. The aim of this cross-border cooperation program was to strengthen the capacity of the Adriatic region for sustainable development through a joint strategy of action among partners from specific areas. The most important goal of the NETCET project was to develop a joint strategy for the protection of marine mammals and sea turtles in the Adriatic through regional cooperation (Adriatic cooperation). Marine mammals and sea turtles are common, endangered natural legacy that cannot be managed by a single state. Due to the migratory nature of these species and shared responsibilities between Adriatic states, cooperation was needed in planning an effective long-term protection strategy. The problem of protection of marine biodiversity, especially the protection of marine mammals and sea turtles is a common goal for all countries in the Adriatic, but practical experience in this field in the region varies from area to area. It is therefore recognized as important to bring together best practices and experiences in order to define a common protection framework, tools and measures for the protection of endangered marine species.
NETCET project, coordinated by the city of Venice, was managed by thirteen partners from several Adriatic countries: Montenegro, Italy, Croatia, Albania and Slovenia. From theory to practice, in June 2013, monitoring of marine mammals by ships within territorial waters of the Republic of Montenegro, started with members of Blue World Institute from Croatia, in close cooperation with the Institute of Marine Biology in Kotor. This research provided the first data on the presence of marine mammals in this region.
A three-member team from The Institute of Marine Biology from Kotor has been trained by experts from the Croatian Blue World Institute about basic photography techniques and how to identificate a particular species of dolphins, according to special markings (notches, scars, natural coloring, etc.) on their fins and bodies. From 26 done field trips, 15 resulted by finding and observing dolphins. The majority of dolphins were found in the open waters of the Adriatic within Montenegrin territorial waters and two partially regular groups appeared frequently, one in front of the famous tourist place Petrovac (near the town of Budva), and another inside Boka Kotorska Bay. This knowledge was used to implement a detailed conservation plan for cetaceans and enforce their protection. A total of 8 individual bottlenose dolphins were identified through photo-ID during the research effort in Boka Kotorska Bay. However, later the same study reported 72 catalogued individuals in the Montenegrin waters.
An article published in 2016, confirmed the presence of bottlenose, striped dolphins and other cetaceans such as the Cuvier’s beaked whale and the Risso’s dolphin and occasional sightings of fin whales in the Boka Kotorska Bay. However, only bottlenose dolphins were pinpointed as regular visitors of Montenegro. [(16)] The Montenegro Dolphin Project ran the first dedicated annual survey effort within the coastal and offshore waters of Montenegro between 2016 and 2017, with plans to keep the survey effort going until 2020. The results presented contribute to fill the gaps in knowledge and provide baseline information on the cetaceans of Montenegro. During the study, regular sightings of bottlenose dolphins and striped dolphins were recorded throughout the year. The encounter rate of bottlenose dolphins was estimated at 4 groups (9 individuals) per 100 km2 for the entire country. Additionally, photo identification study of bottlenose dolphins revealed multi-year sightings of individuals with varying degrees of residency patterns, ranging from transient to regular individuals. Several individuals were noted to travel from the southern to the northern edge of Montenegro, and vice versa, with a maximum re-sighting distance of 80 km. This project builds on integrating scientific research with community engagement for sustainable and effective conservation strategies on marine environment in the South Adriatic Sea. The focus is on cetaceans, because of their vital role on the balance of the marine ecosystem, as top predators. All of the cetacean species found in Montenegro are either classified as “Threatened” or “Data Deficient”, therefore conservation and management measures are of enormous importance not only on these species but also on the ecosystem that they support. Up until this project there have been no systematic annual scientific surveys carried out in Montenegrin waters, despite the consistent and expanding human threats. Montenegro is already a partner country of ACCOBAMS (The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area), and thus it holds the goal of healthy marine ecosystems through cetacean conservation. The lack of knowledge on cetacean populations here is, indeed, one of the strongest barriers against effective marine conservation effort in Montenegro.
For this purpose, the project was designed to carry out standardised annual surveys. Surveys were conducted both from the land and by boat, covering the entire coastline of Montenegro. These surveys provide regional level data about distribution, population statuses, abundance, residency patterns and human impacts, specifically touching on the effect of marine traffic. Besides the scientific scope of the project, another objective is to engage and inform stakeholders, from fishermen to students, and encourage them to carry out citizen science activities by organising community activities. This particular report aims to delineate the outcomes of our annual survey effort to initiate the first steps towards efficient conservation measurements and to raise awareness in the community about the cetacean species inhabiting the coast of Montenegro. [(17)]

Figure 8: The map of survey area (showed in light blue polygon). The polygon has been created according to our line and boat surveys to represent the true coverage

The entire coastline of Montenegro, between Ada Bojana and Herceg Novi has been surveyed using a combination of fixed land stations and boat based surveys. Survey area covered the coastline and

territorial waters in Montenegro (Figure 8).

5 survey stations were selected to represent the Southern Adriatic Sea along the Montenegrin coastline (Table 1). Each survey station was selected with an optimal vantage point to study the animals as good as possible. Land based observations enable researchers to observe the natural behaviour of the focal group, without the possible impact of research vessels nearby. Two sets of land surveys were conducted; morning surveys (beginning with sunrise) and afternoon surveys (ending with sunset). Each survey occupied a minimum duration of three hours.

To determine geographic positions, a theodolite (SOKKIA DT5A) was operated and vertical and horizontal angles of target objects were recorded. To transfer the theodolite readings into geographic positions the tracking software Pythagoras (version 1.2) was used, based on the predetermined reference point and azimuth.

Station	Longitude	Latitude	Altitude (m)
Ulcinj	19˚12'37.8"E	41˚55'28.7"N	92
Utjeha	19˚08'45.8"E	41˚59'46.1"N	8
Bar	19˚04'18.7"E	42˚07'10.7"N	18
Petrovac	18˚55'17.4"E	42˚12'54.2"N	148
Herceg Novi	18˚32'24.8"E	42˚27'10.9"N	84

Figure 9: The coordinates and altitudes of land stations

At least four researchers were present during the land surveys; one researcher was responsible for the theodolite operation, another one for entering the theodolite data in a computer in the Pythagoras software and at least two researchers were engaged with the scanning of the sea surface with binoculars. In case of a sighting, the behavioural data of the focal animals was determined ideally by the person using the theodolite. The other person with binoculars was responsible for entering the behavioural data on the data sheet. All members of the observation team rotated their responsibilities hourly.

Boat surveys have been carried out by following five different routes for the purpose of covering the entire Montenegrin coastline. 1. Bar to Utjeha, 2. Ulcinj to Utjeha, 3. Ulcinj to Ada Bojana, 4. Budva to Kotor and 5. Kotor Bay. Each route was tried to be followed at least once per month and data collection took place between sunrise and sunset (6:00 and 21:00), covering 3 to 7 hours per day, depending on the sea conditions. Surveys took place only in calm seas with Beaufort Sea State between 0-3 and good visibility (>1nmile). The speed of the boat was relatively constant with an average of 3 knots. Surveys have been carried either with 6-meter outboard engine fishing boats, 12-meter outboard speed boats or 17 m sailing boat under inboard engine.

Using a GPS (Global Positioning System), the geographic position of the observation boat was recorded every 3 seconds. In case of cetacean presence, the angle and the distance of the focal group from the boat was determined, to calculate the true coordinates of the cetacean group. The boat approached to the sighted cetacean group with an idle speed to get an accurate data and photographs on the focal cetacean group. As such, focal cetacean group was approached from the side or rear of with an idle speed whenever possible. The focal group was followed from a minimum distance of 50 m to a maximum of 400 m and if the dolphins approach closer, our vessel speed was reduced gradually. The research boat avoided showing sudden changes on its direction and speed. Any changes in the behaviour of the focal group due to the presence of the research boat were also recorded in order to measure our impact.

The survey team consisted of minimum 5 researchers; one researcher scan with the naked eye until 500 m distance from the boat, two researchers use binoculars scanning onward from 500 m, two photographers stationed on the bow-side of the boat. Researchers rotate hourly (starboard, centre, port) to avoid fatigue. While starboard and port researchers were responsible from actual sightings, the researcher in the centre was only responsible from data recording. All sightings and effort data as well as environmental and survey conditions was recorded on the printed data sheets and entered into a database at the end of a survey day. Focal group datasheets contain information on cetacean species observed, observation time, observation number, the distance and angle of the species from the observation boat, species cluster size, their behaviour, their impacted behaviour. Environmental datasheets were composed of cloud cover, Beaufort scale or glare percentage on the sea surface.

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While focal group was recorded every 5 minutes after the initial sighting, environmental data collected in hourly bases. Focal groups were defined as any aggregation of dolphins, observed in a clearly visible constellation (less than 100 meter apart from each other), with similar behavioural activities. The method of focal group scan sampling was chosen to collect behavioural data. With scan sampling the behaviour of all individuals in a focal group are recorded at a predetermined time interval of 5 minutes. Those behaviors can be regarded as states or events; behavioral states endure for an appreciable time, whereas behavioral events are instantaneous. Both, events and states were documented. Per each sampling unit (every 5 minutes), the present behavioral states and events and the number of individuals engaged with these behaviors were noted. In addition, the dominant behavioral state, with which the majority of individuals was engaged, was recorded as well. Behavioral states and events were explained in detail in the following Tables.

Behavioural States	Definition
Travel (TR)	Individuals move with a constant speed in a certain direction with diving interval between 3 and 5 seconds. They move at least 200 m in 1 minute
Diving (DV)	Dive periods can range from 30 seconds to several minutes. Individuals show no obvious movement and resurface at almost the same location. They move less than 200 m in 1 minute
Travel Diving (TR-DV)	Individuals move to a certain direction but dive for appreciable time (<1min) and reappear at a distance. They move at least 200 m in 1 minute
Surface Feeding (SU-FE)	Individuals show active, rapid directional changes. The presence of birds and a lot of splashes is likely
Socialising (SOC)	Individuals show various interactive behaviours and create body contact with each other. Events like synchronized full leaps or tail slaps are likely
Resting (RE)	Individuals are drifting in a slow swimming speed near the water surface with steady and synchronous movements. Dive intervals are short. They move less than 100 m in 1 minute
Milling (MI)	The group shows a non-directional movement and varies in its bearing but stays constant in its cohesion
Bow-Riding (BOW)	Individuals swim in front of a boat
Interacting with boat (IN)	Individuals swim along the sides or behind a boat

Figure 10: Ethogram of all predetermined behavioural states and their abbreviations used in the study

Behavioural Events	Definition
Tail slap (TS)	Individual slaps its fluke on the water surface
Spy hoop (SH)	Individual raises its head shortly above the surface
Breaching (BR)	Individual leaps out of the water and lets its body slap the surface
Belly up (BU)	Individual turns upside down with the belly up
Full leap (FL)	Individual leaps its complete body above the water surface
Fluke up (FU)	Individual protrudes its fluke above water surface

Figure 11: Ethogram of all predetermined behavioral states and their abbreviations used in the study

Besides the behavioural states and events, their swim style and the group type was also recorded. The swim style of the focal group represented the spatial structure and formation of the group (Table below). The group type described how the group is formatted based on the distance between the individuals in a group. Group type was categorized as either "alone" when there was one single individual, "tight" when the group was close together with a distance to each other below 5 m, "far" for a spread group with a distance to each other above 5m or "mixed" when some individuals were close to each other and others far apart.

Swim Style	Definition
Alone (AL)	One single individual is present
Line (LI)	Individuals swim in a line head to tail. The line can be straight or offset
Circular Dives (CD)	Individuals create a circular formation by appearing in turns at the surface after each other
Clustered (CL)	Individuals are clustered with no directional movements
Spread (SP)	The group is spread out. Individuals do not swim close to each other
Front (FR)	Individuals swim in a line side by side.
Team (TE)	The group split up in smaller independent groups ("teams")
Kettle (KE)	Often appears while group feeds at the surface. Many splashes can be seen; water seems boiling like a kettle
Varied (VA)	The group shows a variation of different swim styles

Figure12: Ethogram of all predetermined behavioral states and their abbreviations used in the study

Moreover, for each sampling unit (every 5 minutes) the exact time, species, group number and group size were recorded, as well as the surrounding marine vessels and their estimated distance to the focal group. To distinguish between diffe-

rent focal groups during one survey, each group was numbered. When an observed group was out of sight for a timeframe of more than 20 minutes, the next sighting was considered as a new group. In case of a group splitting into to subgroups, the group number of the subgroups were documented as the previous group number added with "a" or "b".

Surveys were carried out over the course of 212 days (710 hours) between 15.09.2016 and 03.10.2017, of which 180 days (537 hours) were from land and 32 days (173 hours) from boat. The survey effort for each season was similarly distributed, whereas it was unequal between the sections of Montenegro, with the south section having the highest survey effort throughout the year (Figure below). Out of the three sections of coastline defined to survey the Montenegrin waters, 70% of surveys were carried out in the South, 19% in the centre and 11% in the North.

Overall, bottlenose dolphins were encountered on 74 days and striped dolphins were encountered on 12 days ((Figure 13). A focal group behavioural follow of bottlenose dolphins ranged from one sampling unit (5 minutes) to 29 sampling unit (145 min), while it was three (15 minutes) to 14 sampling units (70 minutes) for striped dolphins. The average group follow for both species was six units (30 minutes).

Group size of bottlenose dolphins varied from 1 to 112 individuals with a mean of 4 dolphins. The median group size was of 3 and half of the observation lied between 2 to 5 individuals per group. Whereas striped dolphins showed a variation ranging from 1 to 25 individuals with a mean of 8 and median of 5 individuals in a group and half of the observation lied between 3 to 13 individuals in a group.

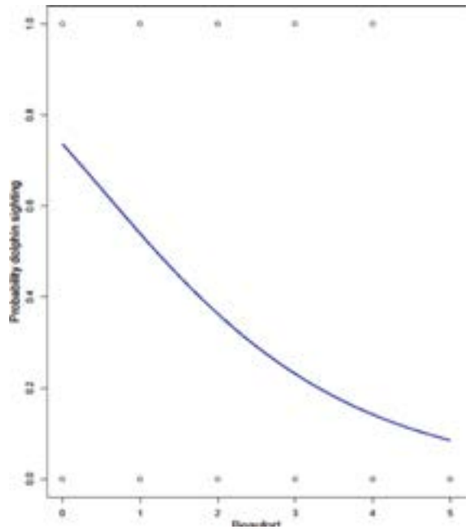

Figure 14: The effect of Beaufort on the probability of dolphin sighting

The probability of dolphins sightings were significantly affected by the survey type ($\chi 2 = 9.081$, df = 1, p = 0.003), whereas section and season were found to have no significance on dolphin sightings. Despite the much greater amount of land surveys, sighting probabilities were found to be greater from the boat, with dolphins seen about 67% of the time against only 34% for land based surveys. On average, 1.5 dolphin groups were sighted per boat survey against only 0.5 per land survey.

Despite the uneven spatial sampling pattern, no section (coastal region) revealed an increased sighting probability when compared to the others (p>0.05). Yet, the middle section holds the highest recording of sightings among the other sections by 1.4 groups per survey, even though the variation wasn't significant. Within boat-based observations, surveys covering the totality of the coastline instead of any specific subset were more likely to result in a sighting (sd=0.60, z=3.05, p<0.01).

No statistically significant effect of seasonality on sighting rates was found. Nevertheless, a clear trend towards increased sightings in winter and spring was observed, with an average sighting per survey of 1.2 groups. No effect of month on sighting probability was found. Lastly, when general environmental conditions were analysed Beaufort explained the variation in sighting probability best (AIC=266) (Figure 14). Sighting rate strongly decreased as Beaufort value increased (sd=0.14, z=-3.87, p<0.001).

Season	Section	Survey effort in days (hours)	Number of sightings		Number of groups		Dominant Behaviour	
			TT	SC	TT	SC	TT	SC
Autumn	South	42 (115:31)	17	6	32	7	TR,DV	TR,DV
	Middle	10 (27:10)	1	0	3	0	DV,SOC,RE,TR	NA
	North	6 (34:31)	3	0	3	0	TR	NA
Winter	South	35 (99:49)	15	2	24	2	TR	TR
	Middle	7 (17:27)	2	0	7	0	TR,DV	NA
	North	2 (13:00)	1	0	1	0	TR	NA
Spring	South	33 (108:32)	9	1	10	1	TR	TR,DV
	Middle	10 (31:36)	3	0	8	0	TR	NA
	North	6 (38:35)	2	0	7	0	TR	NA
Summer	South	39 (107:56)	14	0	15	0	TR	NA
	Middle	12 (42:24)	4	0	5	0	TR,DV	NA
	North	10 (74:04)	3	3	5	6	TR	TR
Overall		212 (710:35)	74	12	85	16	TR	TR,DV

Figure 13: Number of survey effort, sightings and groups for each species per season and section in Montenegro (TT=Bottlenose dolphins, SC=Striped dolphins; TR=Travelling, DV=Diving, SOC=Socialising, RE=Resting; NA=Not applicable)

Figure 15: The variation on group size under different swim styles (CD=Circular Dive, CL=Cluster, FR=Front, KE=Kettle, LI=Line, Sp=Spread, TE=Team, VAR=Varied)

To analyse the encounter rate with a correction of the bias on the boat survey effort, 282 grid cells were created in the survey area and only 100 grid cells were used during the analysis. The overall encounter rate was estimated on average 3,5 groups and 9,2 individuals per 100km in Montenegro.

Variation in dolphin group size was best explained by a model taking season, time of the day, swim style and distance to the nearest marine vessel into account (AIC=2019). When the main effects were considered, season had a significant effect on group size with the lowest group size recorded in spring months with an average of 2 individuals in a group (sd=6.75e-2, z=-2.78, p<0.01), whereas, the highest group size on average was 3 in summer. Additionally, swim style was found to be highly correlated with group size (sd=1.26e-1, z=7.34, p<0.001), with an increase during kettle, team and varied styles (Figure 15). Distance to the nearest marine vessel alone had no significant effect on the variation in group size.

Overall, 50 individuals were catalogued in Montenegro, of which 15 individuals were re-sighted at least twice. The re-sighting of the individuals varied from 19 to 401 days. Regarding the re-sighting locations, seven and four individuals were re-sighted only on the south and north section respectively. Yet, four individuals were re-sighted in all sections from north to south, with a maximum re-sighting distance of approx. 80 km.

The monthly residency ranged between 0.07 and 0.29 with a mean of 0.10±0.05. On the other hand, the seasonal residency of bottlenose dolphins ranged from 0.20 to 0.60 with a mean of 0.25±0.10. The site fidelity index ranged from 0 to 0.3, with a mean of 0.06±0.10. Considering all the above results, hierarchical cluster analysis suggests that three main group of residency patterns were present in Montenegro (Figure below). Group 1 was composed of 6 individuals and hold high residency indices but comparably low site fidelity, thus classified as regular. Group 2 had 35 individuals with the lowest residency rates and site fidelity indexes. Group 2 individuals were only sighted once or multiple times in the same day with no follow up sightings in following days or months, thus classified as transient individuals. Whereas, Group 3 holds 9 individuals with the highest site fidelity and considerably high seasonal residency thus they have classified as frequent visitors.

Group	Seasonal Residency	Monthly Residency	Site Fidelity
1	0.433	0.167	0.091
2	0.200	0.071	0.000
3	0.333	0.159	0.247

Figure 16: The mean seasonal and monthly residency indices and site fidelities of bottlenose dolphins according to the groupings of agglomerative hierarchical cluster analysis

According to the photographed individuals of bottlenose dolphins, the individuals showed no obvious marks of starvation signs. However one individual recorded with an abnormal tissue development on the right side of its body (Figure 17).
Regarding to the direct consequences of human interactions, one individual dolphin recorded with a plastic bag around its blowhole (Figure 18).

Figure 17: Bottlenose dolphin with an abnormality

Another individual, called Tangled, suffered from an entangled rope around its tail and fractured his tail either during or after the entanglement (Figure 19). Tangled were photographed in six different dates by our research team in Kotor Bay in summer 2017 and also its presence were reported by the locals. During each encounters, Tangled were spotted alone and close to the human settlements, ports and boats.

Figure 18: A dolphin entangled with a plastic bag

Figure 19:"Tangled" with an entangled rope on the fractioned tail

Additionally, between 1999 and 2001, three dead dolphins were stranded in Kotor bay, Bigova and Herceg Novi, Montenegro. The post-mortem examination determined the cause of death was from firearms and dynamite fishing, respectively. In 2008, another dolphin washed ashore in the beach of Igalo. It was probably killed deliberately since the fins were cut off and assumingly kept as a trophy. Another dead dolphin, stranded in 2013 near Tivat, was thought to have drowned in fishing gear. Two more strandings were recorded in 2017, with one of them recorded as striped dolphin on the 10th of April in Budva. The cause of death was assumed to be related to dynamite fishing. Latter, a highly decomposed dolphin carcass found drifting in the sea on the 12th of October in Budva.

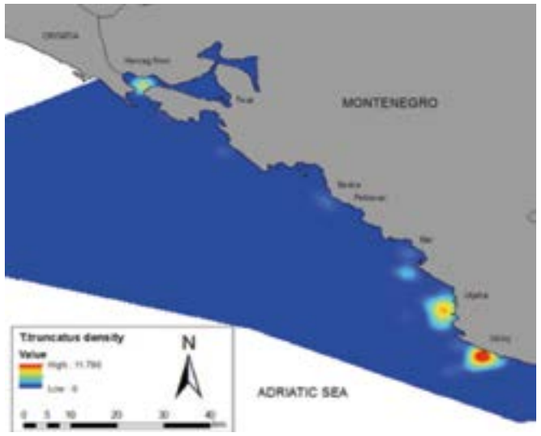

Figure 20: Density distribution of bottlenose dolphins in the survey area

According to the results of the study, south section of Montenegro (Ulcinj and Utjeha) has the highest density recordings of bottlenose dolphins. Additionally, north section of Montenegro, specifically the entrance of Boka Kotorska Bay also holds important density of bottlenose dolphins in its waters (Figure 20).
It is important to highlight that south section also holds the highest survey effort (Figure: 13), which is the likely reason of high sighting rate. Bottlenose dolphin presence is confirmed mainly to coastal areas, with a range of up to 80 m depth and their maximum distance to the nearest coast was recorded as 8 km. Regarding the striped dolphins, their highest density recorded 30 km of the coast (Figure 21).

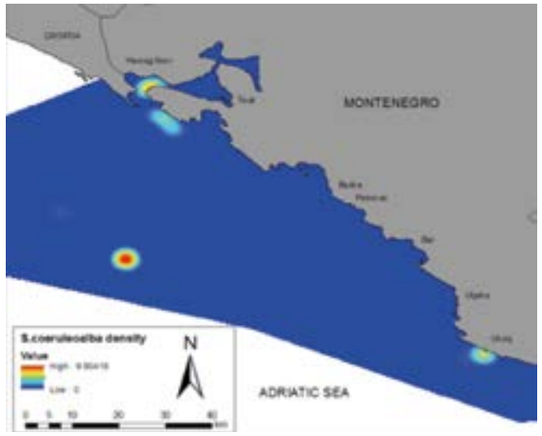

Figure 21: Density distribution of striped dolphins in the survey area

However, their high coastal presence was also recorded in the south and north section of Montenegro, mainly in the coastal waters of Herceg Novi and Ulcinj. Their depth preference ranged from 10 m depth waters up to 450 m depths. However, it is important to consider that the hotspots highlighted by this map are representative of our sampling locations and the nature of the surveys, with south section notably surveyed more than the rest of the sections.
After the detailed results of the first study of marine mammals in Montenegro, the annual research was continued and great efforts and resources were invested in order to gather as much knowledge as possible about their life in the territorial waters of Montenegro. The 2021 annual report presents summary research results for all years.
Montenegro Dolphin Research Team has had an ongoing survey effort in Montenegro. The report approaches data that was collected between 2016 and 2020, with additional information from 2021 to investigate changes in dolphin sightings when human impact reduced even slightly during the COVID-19 pandemic.
The report firstly presents the variation in survey effort per year and its associated sighted species within Montenegrin waters. Later, the annual variation in sighting rates of bottlenose dolphins is described with an assessment of behavioral preferences and group cohesion for southern, central and northern Montenegrin waters.
Photo-identification results are also presented with their sighting history in Montenegro. Further, re sighting maps have been produced to investigate the movement patterns of individual bottlenose dolphins.
Preliminary results on the vocalisation behaviour of bottlenose dolphins in the Boka Kotorska Bay also analysed by RavenPro software and summarised in this report.
Species distribution was mapped to visualise bottlenose dolphin range and habitat preferences. Bottlenose dolphin data points, collected from land and boat surveys, were clustered according to survey date and group number. Paths were then created to show dolphin movement along the Montenegrin coast and in Boka Kotorska Bay. Based on these paths, kernel density maps were produced. Finally, contour polygons were drawn to indicate bottlenose dolphin core zones (50% inclusion for seasonal and annual variation, 70% inclusion for general variation). Initially, seasonal variation was assessed. Core zones, depth and distance to shore of dolphin observations for each season were compared. Following their seasonal spatial distribution, core zones were calculated for each year to allow for a comparison between years. Then, general spatial distribution was mapped for the entire period between 2016 and 2021. Finally human pressure maps, including marine traffic and seismic operation were mapped to overlap the general core zones of bottlenose dolphins and human pressure in the area to assess the impact range. Marine traffic maps were created using boat data points from land surveys. Kernel density maps were then produced in the same way as for the bottlenose dolphins. Following the total spatial distribution, specific density maps were created according to the aforementioned boat types (and activities):

· Tourism: JS, MB (TO), LB, PED, SB
· Small fishing: MB (FI)
· Big fishing: FV
· Transport: FE, PB
· Large ships: CS, CR

The seismic operation map was produced using GPS coordinates from three ships performing seismic activities in 2019: the Sanco Sea, the Ramform Titan and the Thor Freyja. Kernel density maps were produced in the same way as for the other maps.
All spatial analyses were conducted in QGIS software, Version 3.14.18 [18]
The territorial waters of Montenegro were surveyed using a combination of fixed land stations and boat-based surveys since 2016 (Figure 22). The land survey coverage was calculated using wedges for each land station. The extent of a wedge was determined using the outermost data point collected on either side of a station. The radius of the wedge was determined using the furthest data point collected. The total land survey coverage was 509 km2. The boat survey coverage was calculated by drawing an area around the boat survey track lines in Montenegrin waters. The total boat survey coverage was 5,069 km2 with the furthest distance of 83.5 km from the nearest coast. The surveys were mainly conducted in shallow waters (<100m depth), the maximum depth that was surveyed reached to 1000 m depth.

Figure 22: Survey Area of Montenegro with land station and boat survey coverages

To cover all of the coastal waters of Montenegro, the project has nine predetermined locations along the Montenegrin coastline and in the Boka Kotorska Bay (Figure 23). Every land survey location was carefully selected at least 10 meters above sea level with no obstructions such as trees or buildings blocking the line of sight. This maximised the range of view and thus the likelihood of cetacean sightings. The observations were conducted during the morning (beginning with sunrise) and the afternoon (ending with sunset) for a minimum of 3 hours. By completing land-based surveys, researchers observe cetaceans in their natural behavioural state without being disturbed by the research vessel.

Station	Longitude	Latitude	Altitude (m)
Ulcinj	41˚55'28.7"	19˚12'37.8"	33
Utjeha	42˚03'01"	19˚07'52"	78
Bar	42˚07'11"	19˚04'19"	23
Petrovac	42˚13'14.09"	18˚54'42.77"	165
Verige	42˚28'38.20"	18˚41'25.19"	14
Lustica Bay	42˚23'20.54"	18˚39'51.012"	103.6
Kakrc	42˚24'14.942"	18˚40'14.37"	30.2
Rose	42˚25'26.85"	18˚34'9.25"	255
Herceg Novi	42˚27'11"	18˚32'25"	84
Lustica Bay	42˚23'20.54"	18˚39'51.012"	103.6
Kakrc	42˚24'14.942"	18˚40'14.37"	30.2
Rose	42˚25'26.85"	18˚34'9.25"	255
Herceg Novi	42˚27'11"	18˚32'25"	84

Figure 23: The coordinates and altitudes of land stations

During all the land- and boat-based surveys the environmental conditions were recorded every 60 minutes or when the conditions changed as environmental conditions can influence the visibility of the cetaceans. The conditions that were recorded consist of the tide height, sea state, glare, cloud cover, sea surface temperature, swell, air temperature, wind speed and direction. The sea state was recorded using the 0-12 integers of the Beaufort scale. Glare and cloud cover were estimated as a percentage in steps of 10 (0, 10, 20, 30, 40 etc.). The tide, sea surface temperature, swell, weather temperature, wind speed and direction were ascertained from online sources before the survey started. Environmental conditions were noted on a datasheet as well as in the software Pythagoras.
When the team of at least 4 researchers arrived at the survey station, the team leader divided the tasks. One researcher was responsible for theodolite operation, one for entering the horizontal and vertical data from theodolite onto the laptop using the program Pythagoras. The other researchers were constantly scanning the sea with binoculars. In case of a cetacean sighting, the researcher on the theodolite would give the behavioral information of the cetaceans. One of the researchers on the binoculars was responsible for writing down all the information on the datasheet. Tasks were rotated periodically to avoid observer fatigue.
An attempt was made to conduct boat surveys at least every 10 days, dependent on the weather conditions and logistics. Additional logistical issues were introduced due to restrictions resulting from the COVID-19 pandemic in 2020 and 2021. Boat surveys took place throughout the year in calm seas, where the visibility was more than 1 nautical mile and there was a Beaufort Sea State between 0-3. These surveys took place between sunrise and sunset times (06:00 and 21:00). Depending on the sea state, the surveys lasted between 3-7 hours. Surveys were generally conducted at a speed of 4 knots, and 3 different kinds of boats used:
1. Motorboat with an outboard engine, with a length of 6 metres;
2. Rigid inflatable Boat with an inboard engine, with a length of 12 metres;
3. Sailing boat with an inboard engine, with a length of 17 metres.
To create the track line of the survey, the geographical coordinates of the boat were recorded every 1-2 minutes in the software Logger 2010 (Marine Conservation Research, 2019). For this, a GlobalSat G-Star IV (SIRF Star IV) GNSS (Global Navigation Satellite System) was used. The software Logger 2010 also recorded data on the date and time of the survey, the number of researchers and their responsibilities, behavioral data of cetaceans, marine traffic and environmental data which was collected as with land surveys. To calculate the true coordinates of the cetacean group, the distance and bearing of the focal group were recorded during the sighting. In the case of a cetacean sighting, the research boat/vessel would approach and follow the focal group maintaining a low and consistent speed from the side or rear and in the case that the cetaceans approached the research boat/vessel, the speed was reduced gradually to idle. The distance between the cetacean and the boat ranged from a minimum of 50 metres to a maximum of 400 metres. Any sudden changes in the speed and direction were avoided and in order to measure the impact of the presence of the research vessel, any changes in the cetacean's behavior were recorded. During both the land and boat-based surveys, researchers used a focal group scan sampling to collect time and date of the observation, species, group size, behavior, reaction to marine traffic, presence of juveniles and surrounding marine traffic. All data was collated to a database at the end of each week and photo-identification pictures and acoustic recordings were saved on a hard drive and regularly backed up.
In total, 699 surveys (2339:20 hours) were carried out between the 15th of September 2016 and 26th of April 2021 (Figure 24). The majority of the survey effort consisted of land surveys which formed 84% of the total effort. While three years (2017, 2018, 2019) had full yearly survey effort, 2016 had only five months, covering autumn and winter, and 2020 and 2021 had eight and four months of survey effort, respectively, due to restrictions that took place during the COVID-19 pandemic. While the highest survey effort was in 2017 with 192 days spent in the field, the lowest efforts were in 2016 with 51 days and 2021 with 53 days of surveys. It is important to note, however, that the survey effort for 2016 and 2021 represents only five and four months of survey, respectively.

Year	Boat Survey (Sighting)	Land Survey (Sighting)	Total
2016	8 (5)	43 (20)	51 (25)
2017	31 (20)	161 (51)	192 (71)
2018	36 (23)	118 (35)	154 (58)
2019	23 (11)	132 (26)	155 (37)
2020	18 (8)	76 (17)	94 (25)
2021	6 (3)	47 (22)	53 (25)
Total	122 (70)	577 (171)	699 (241)

Figure 24: Number of survey days of each survey type. The number in brackets represents days where a dolphin sighting took place [19]

Regarding variation in survey effort per season, each season was surveyed almost equally with a slightly higher survey effort in autumn with 200 days. The lowest survey effort was recorded in win-

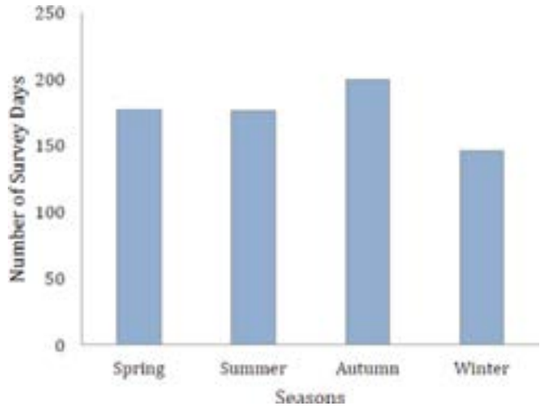

Figure 25: Number of survey days per season

ter with 146 days of survey effort (Figure 25).
Overall, 403 focal groups were encountered in 241 days of survey effort, during which two species were recorded; Bottlenose dolphins (Tursiops truncatus) and striped dolphins (Stenella coeruleoalba). While bottlenose dolphins formed the highest sighted species being responsible for 95% of the sightings, striped dolphins were only encountered

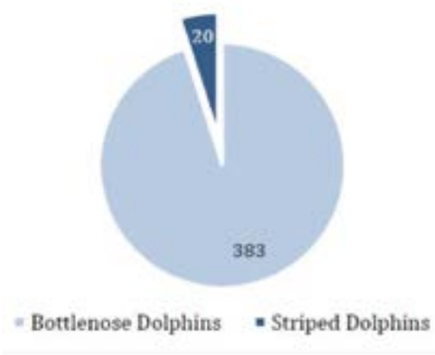

Figure 26: Species sighting numbers during the surveys [20]

on 20 occasions (Figure 26).
When the encounters were assessed by season, even though bottlenose dolphins were slightly more regularly encountered in spring months with 29% of their entire sightings, their sighting rates were similar between seasons with a minimum rate recorded in summer of 22% (Figure 27). Therefore, bottlenose dolphins do not appear to use Montenegrin waters preferentially in a season, instead showing a similar abundance between seasons. On the other hand, striped dolphins were rarely sighted, with the highest encounters in the summer and autumn months with 8 encounters in each season, followed by three encounters in win-

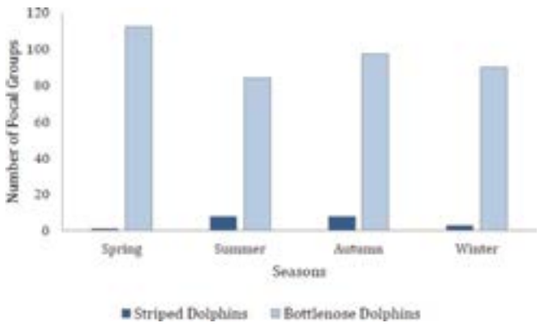

Figure 27: Seasonal variation in the sightings of dolphins in Montenegro [21]

ter and only one in spring (Figure 27).
When the yearly variation on the bottlenose dolphins' sighting rate was assessed, the species were sighted in 49% of surveys in 2016 with a steady decline in their sighting rate up until 2019, with 37%, 38% and later 24% in 2017, 2018 and 2019 respectively. Later in 2020, the sighting rate slightly increased to 27%. However, the sighting rate reached up to 47% in 2021 (Figure 28). The variation in the sighting rate of striped dolphins was not exami-

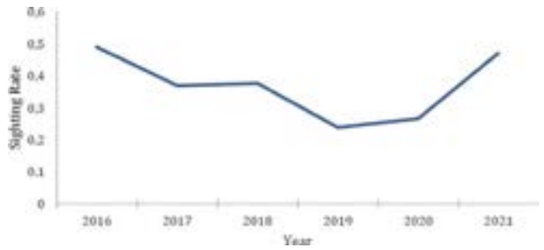

Figure 28: The yearly variation in sighting rate of bottlenose dolphins in Montenegro [22]

ned due to the small sample size.
Dolphins were followed for an overall of 181.6 hours of the 2339 hours of survey effort (7.8%), comprising 2179 behavioral sampling intervals. While group sizes of bottlenose dolphins ranged from 1 to 20 individuals with a mean of 3/2 individuals and mode of 2 individuals, it was between 1 and 30 individuals with a mean of 7/2 individuals for striped dolphins. Approximately 50% of the bottlenose dolphins' groups had at least one sub adult, yet sub adult groups were also recorded with a maximum group size of six. Striped dolphins were also recorded with sub adults in 20% of the recordings, with the number of sub adults ranging from 1 to 10 in a group.
Focal group scan sampling of bottlenose dolphins revealed that the dominant behavior recorded in Montenegro was diving, forming 35% of the total recordings, followed by travelling behavior, making up 26% of recordings. Bow-riding was the least reported behavior when combined with interaction with marine vessels formed 3% of the total recordings, which is equal to the reported resting behaviour (Figure 29).

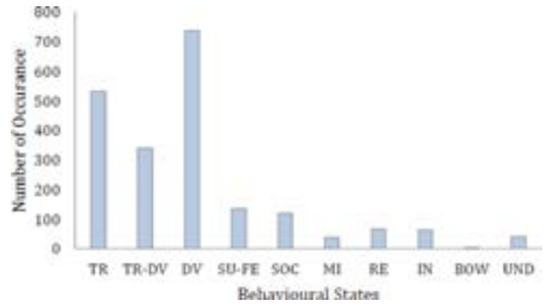

Figure 29: The behavioural variation of bottlenose dolphins in Montenegro [23]

Striped dolphins also showed similar behavioural patterns with diving forming 22% of the reported behaviours followed by traveling (19%), travel-diving (18%) and surface feeding (16%). Bow-riding was once again the least recorded behaviour (Figure 30).

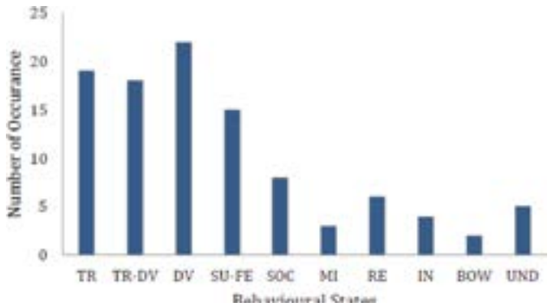

Figure30: The behavioural variation of striped dolphins in Montenegro [24]

When the effect of year and season on behaviours was considered, bottlenose dolphins showed similar patterns between years. Each year, either diving or traveling was the most dominant behaviour. Similarly, either resting or milling was one of the least recorded behaviour, except in 2017 where dolphins engaged in relatively more resting. Further, interaction with boats was highest in 2018 (Figure 31).

Years	Behavioural States									
	TR	TR-DV	DV	SU-FE	SOC	RE	MI	IN	BOW	UND
2016	42	23	51	23	18	4	5	0	0	0
2017	197	128	164	26	18	52	13	14	1	7
2018	130	57	228	34	28	8	4	50	2	10
2019	103	25	90	44	25	1	3	0	0	17
2020	32	35	102	6	29	1	3	0	0	6
2021	17	82	102	3	1	2	10	0	0	1
Total	521	350	737	136	119	68	38	64	3	41

Figure 31: Behavioural variation of bottlenose dolphins per year in Montenegro [25]

Season also showed a similar pattern on behavioural variations in bottlenose dolphins in Montenegro, with diving and travelling being the most dominant behaviour recorded. However, travel-diving, diving and interaction with boats showed a considerable increase in Spring, whereas socialising behaviour was highest in autumn (Figure 32).

Seasons	Behavioural States									
	TR	TR-DV	DV	SU-FE	SOC	RE	MI	IN	BOW	UND
AUTUMN	146	53	171	27	62	36	16	4	1	6
SPRING	130	168	274	43	8	6	14	30	0	12
SUMMER	148	64	162	20	32	23	4	16	1	17
WINTER	107	55	130	46	17	3	4	14	1	6
Total	531	340	737	136	119	68	38	64	3	41

Figure 32: Seasonal behavioural variation of bottlenose dolphins in Montenegro [26]

Acoustic data on bottlenose dolphins were collected on 8 separate survey days between the 17th of August 2020 and the 9th of April 2021 in the Boka Kotorska Bay. A total of 7:12 hours of acoustic recordings were analysed, with an average of 56 minutes of recording in each acoustic survey. A total of 5:24 hours of dolphin vocalisations were recorded which resulted in the identification of 847 calls, of which 541 belonged to good quality recordings therefore further investigated. During the recordings, both echolocation clicks and tonal calls were recorded in similar proportions with echolocation clicks recorded slightly more, forming 55% of the entire recordings. Of the 467 echolocation clicks, 27% were formed from burst pulses, thus indicating possible foraging activities. Additionally, nine different whistle types were recorded, of which multiloop whistles were the most dominantly recorded whistles making up 39% of whistles, followed by type U which made up 29% of whistles. Less than 3% of the recordings involved flat, harmonic and a specific call we termed "grunt" (Figure 33).

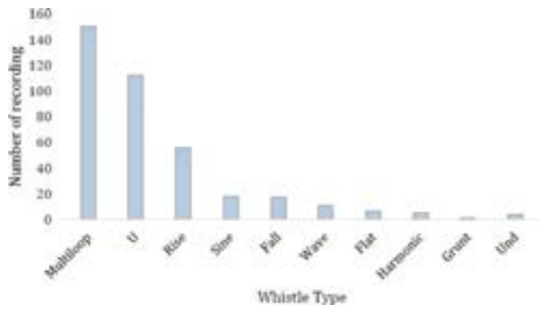

Figure 33: Whistle type of bottlenose dolphins in the Boka Kotorska Bay [27]

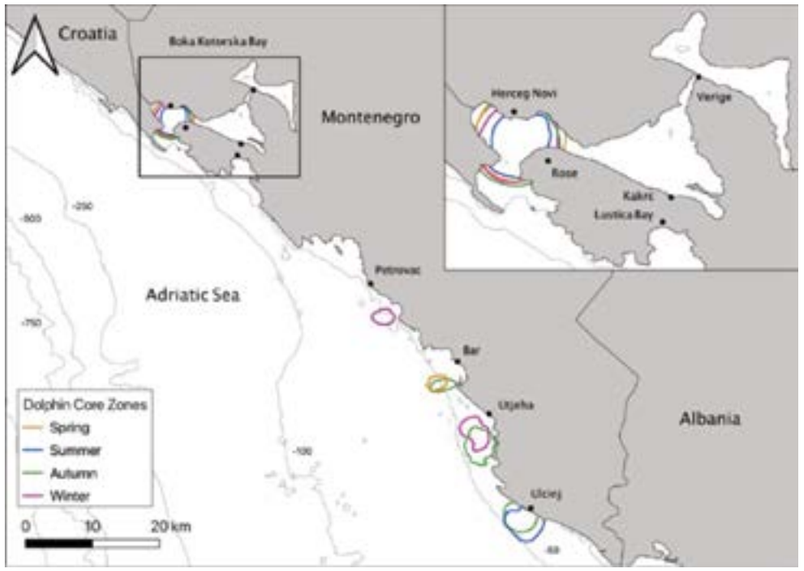

Figure 34: Bottlenose dolphin core zones in Montenegrin waters per season [28]

There was no considerable variation in the depth and distance to shore preferences of bottlenose dolphins between seasons (Figure 34). The median depth range was between 36.5 meters in autumn and 40m meters in summer months, with spring and winter showing the same preference to a median of 39m depth. However, the maximum theodolite range covers waters of a maximum depth of 88m. Therefore, it is important to consider the highly concentrated survey effort in shallow waters and deeper water preference of dolphins might be unnoticed due to the survey methodology. A similar pattern was also recorded when the distance from the nearest coast was considered with the median distance from the nearest coast ranging between 899m (spring) and 1138m (winter). The core zones of bottlenose dolphins were present within the Boka Kotorska Bay for each season, however the core zone in Petrovac was only present in winter months and they were present for spring and autumn for Bar. Utjeha had core zones only in colder months (autumn and winter) while Ulcinj had it for summer and autumn. Next, variation between years was compared. The coastal waters of Bar, Utjeha and Ulcinj contained core zones in 2016, 2017, 2018 and 2020. The entrance of Boka Kotorska Bay contained core zones in 2018, 2019 and 2020. A single core zone was identified further into Boka Kotorska Bay in 2021 (Figure 35). In 2016 and 2017, survey efforts were skewed to the southern section of Montenegro (43 of the 51 surveys in 2016 and 123 of the 192 surveys in 2017), due to DMAD being based in Ulcinj and in Bar in 2016 and 2017 respectively. This explains the absence of core zones in the other sections of Montenegro. The presence of a single core zone in Boka Kotorska Bay in 2021 is directly related to the highly skewed survey effort to the northern section of Montenegro due to the travel restrictions during

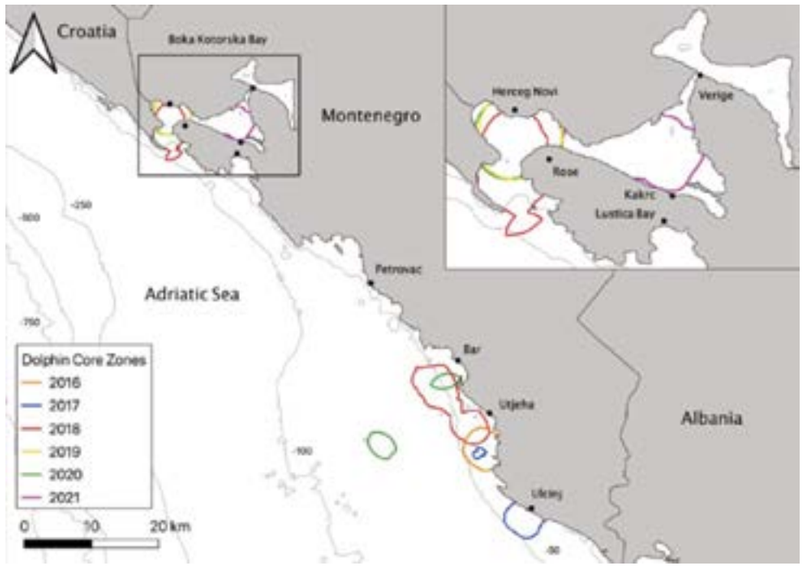

Figure 35: Bottlenose dolphin core zones in Montenegrin waters per year [29]

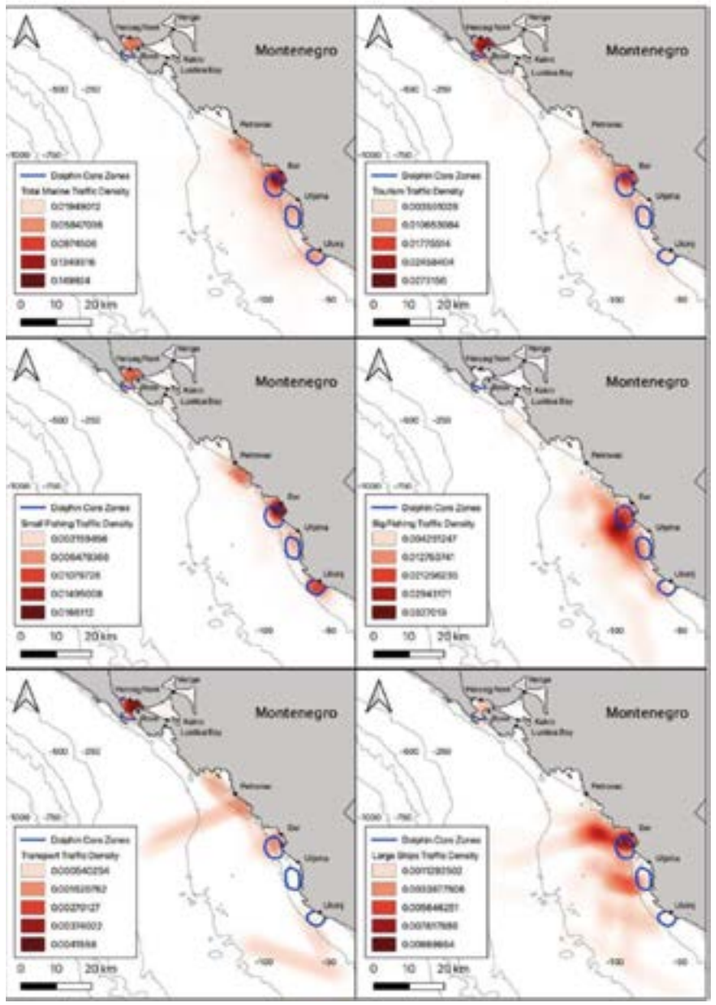

Figure 3: Overlap between general dolphin core zones marine traffic density [30]

the COVID19 period (52 of the 53 surveys).

To visualize the impact of marine traffic on bottlenose dolphin distribution, maps were created showing the general dolphin core zones and the density of the different types of marine traffic (Figure 21). The total marine traffic showed the strongest overlap with the dolphin core zones in the coastal waters of Bar and in the entrance of Boka Kotorska Bay. The strongest overlap with the different types of marine traffic was then identified.

· Tourism: in the entrance of Boka Kotorska Bay and in the coastal waters of Bar · Small fishing: in the coastal waters of Bar and Ulcinj and in the entrance of Boka Kotorska Bay

· Big fishing: in the coastal waters of Bar

· Transport: in the entrance of Boka Kotorska Bay

· Large ships: in the coastal waters of Bar

When the spatial-temporal distribution of bottlenose dolphins was mapped, bottlenose dolphins revealed the presence of year-round core zones in Boka Kotorska Bay which highlights the importance

of this specific location for the bottlenose dolphin populations of Montenegro. It is also important to point out that the southern sections between Bar and Ulcinj showed autumn dominant core zones within their coastlines. Seasonal variations in area preference pose an importance consideration in the development of conservation strategies and increase its impact zone. Therefore, the results of this report have to be considered carefully and should be included in the development of future protection strategies.

Additionally, when the annual variation of the core zones was under the scope, Boka Kotorska Bay once again stands out with its importance not only within the year but also between the years. Yet, in 2016 and 2017 the entrance of Boka Kotorska Bay did not have a core zone due to the low number of survey efforts. Back then, DMAD was located in Ulcinj and Bar respectively and therefore fewer surveys were organised in Boka Kotorska Bay (1 of the 51 surveys in 2016 and 30 of the 192 surveys in 2017). Therefore, the absence of core zones in this specified location is only the result of biased survey effort to the southern waters, rather than reflecting the actual preferences of dolphins.

When the entire dataset between 2016 and 2021 was pooled, the total spatial distribution of the bottlenose dolphins in Montenegro revealed a high-density presence once again in the Boka Kotorska Bay, followed by the neighboring waters of Bar,

Utjeha and Ulcinj.
Regarding the marine traffic density, Bar holds the highest density within its waters, followed by the Boka Kotorska Bay. However, the same locations are also identified as core habitats for bottlenose dolphins due to the high species sighting rates. In an additional pressure, seismic activities for oil and gas exploration take place in the waters immediately off Utjeha and Bar which again shows area overlap with the dolphin core habitats. The identification of these overlapping zones with human activities that are proven to have direct and indirect negative impacts on the threatened species, alters them as "critical habitats" for protection.

Development of tourism product based on dolphin observation and protection in Boka Kotorska Bay

In recent years the requirements for sustainable tourism strategies have widened to include the search for tools that guarantee more benefits for local communities and indigenous peoples, particularly in rural areas. These areas are mostly characterized by rich biological diversity, the central asset for tourism. However, as yet there is insufficient local expertise to create tourism that is beneficial to the local community and maintains the local biodiversity, determining that the course of development is in a sustainable direction according to the UNWTO. In the international tourism market typical tour operators are searching for new products, integrating new countries into their portfolio in order to diversify their tourism packages.
UNWTO also highlights that tourism activities fundamentally involve the transportation and hosting of the tourism consumer in a local community, i.e., "tourism destination," where the tourism product is consumed. A tourism product is therefore the heritage, wealth and expected legacy of the local community that serves as the tourism destination. The core business activity of tourism is to promote, as a tourism package, the "saleable" or appealing aspects of the local community, e.g. the local culture and way of life, physical and natural attractions, as well as social knowledge. UNWTO also refers that the tourism package, which is the complete travel experience; a mosaic of a number of different commodities such as transportation, foods, accommodation, beverages, leisure and other attractions, provides tourists (consumers) with a complete set of services necessary for the tourism experience. The quality of a product, the attractiveness of individual packages and the distinctiveness of a destination can be regarded as the key elements of a successful tourism product. When both the package and the product quality are ensured during product development, tourists will be interested in consuming the offered attraction; they will not only recommend the attraction, but will most likely return to the destination. The number of tourists purchasing a tourism product and the number of tourists that either return to a destination or come as a result of a recommendation are important indicators on the quality of a tourism product. Therefore it is very important for destination managers and local entrepreneurs to maintain and periodically evaluate their existing tourism products and to understand that tourism products have life cycles. (31)
In order to develop high quality products that support biodiversity conservation, UNWTO Practical Guide for the Development of Biodiversity-based Tourism Products emphasizes that destination managers and local entrepreneurs should understand and pay attention to the characteristics of tourism development that support biodiversity conservation. Some essential characteristics include:
• the use of environmentally friendly and low impact techniques, i.e. controlling the number of visitors per site. This is aimed at reducing the level of intrusion to the environment and biodiversity, as well as keeping in line with the carrying capacity of the site;
• encouraging tourists and the local community to support conservation initiatives;
• recognizing that nature, culture and local knowledge are the prime elements for tourist experience;
• providing educational value for tourists and locals;
• supporting the local economy, e.g. through involvement of local community members as guides or hosts or by purchasing local products;
• using tour guides or interpreters who have in-depth knowledge about local nature and culture;
• ensuring that the (observed) animals are not disturbed (e.g. during wildlife watching);
• respecting local culture and tradition. (32)
Involvement of the community is very important since the overall experience of the tourist at a destination is often affected by the attitudes of the local community towards tourism and tourists. The brief encounter between the visitors and the communities that host them can either make or break the product experience according to the UNWTO. Therefore it is necessary to develop appropriate and targeted strategies with timely impacts to increase the capacity of local communities and the possibilities for their involvement as statet in the UNWTO Guide.

When developing sustainable tourism, ecotourism or community-based tourism, also science-based tourism based on dolphin observation and protection it is often initiated by environmental or conservation-based NGOs. They usually work together with local communities or local guides in developing new tourism products and packages. According to the UNWTO, apart from these destination-level stakeholders, national or international tour operators sometimes initiate tourism product development, in cooperation with local tour operators or local tour guides.
A person willing to initiate tourism product development based on science in dolphin observation and protection should have:
• the capability to analyse the existing potential to create the condition according to market preference;
• the capability to communicate with local communities involved in dolphin observation and protection;
• the capability to communicate with tourists interested in science-based tourism;
• awareness, concern and knowledge of community empowerment;
• awareness, concern and knowledge of dolphin conservation;
• awareness, concern and knowledge of cultural preservation;
• the expertise and capability to manage a tour based on dolphin observation and protection; • knowledge on business development, economy and management. (34)

Designing tourism product based on dolphin observation and protection in Boka Kotorska Bay

Designing is one of the important steps because only a good tourism product will have a high selling value and constantly attract tourists according to the UNWTO. A good tourism product should:
• cater to the needs of the targeted market; for example, for the dolphin observation and protection based tourism market, most of the duration of the tour should be spent at the sea locations where dolphins could be observed;
• contribute to dolphin conservation in the Boka Kotorska Bay;
• involve and distribute benefits to the local community;
• provide opportunities for tourists to get first-hand experience;
• provide educational value for tourists and the local community in the field of dolphin protection.
UNWTO defines some key steps that need to be taken when developing a good tourism product. It is important to:

• identify and select the targeted market - in the field of dolphin observation and protection targeted market would be young people and families interesting in connecting science regarding dolphin protection trough tourism experience;
• identify the needs and preferences of the targeted market;
• select the tour activities which will best meet the needs and preferences of the targeted market; • make good use of the inventory database for this purpose;
• decide on who decides at the local level what products should be promoted;
• identify new products that are complementary to the existing ones so that a win-win situation can be created. (34)
When developing a tour package based on dolphin observation and protection in Boka Kotorska Bay it is important to:
• link the component of activities from one attraction to the other carefully: a good combination of tourism products will create an appealing tour package. Combining cultural activities with science based activities might give an added value to the tour on dolphin observation and protection in Boka Kotorska Bay since Kotor is a town of rich cultural and historical heritage. The duration of the tour can be adjusted to the average length of stay of tourists. In this step, a product developer should consider some additional criteria:

– travel time from one location to another or from one destination to another. Longer travel time will affect the condition of the tourists, thus might influence the evaluation of tourists to the overall implementation of the tour and the destination;
– type of transportation used from one location to another or from one destination to another; – type of activities;
– time spent on an activity;
– difficulty and level of fatigue which will be experienced by the tourists;
– cost factors;
– avoiding any discrepancy between the description of the product and reality; – avoiding overloading the tour and allowing for a period of flexible relaxation.

According to the Report on Cross-border Youth Camps consisted in marine research activities for cetacean conservation using thematic equipment on board of BioTours projects Lead Partner Jonian Dolphin Conservation (JDC) Research Vessel "Il Porto di Taranto", tourist activities should be carried out in the form of one-day "mini-cruises", as the long bay is not navigable at high speed due to the speed limits imposed and for obvious safety reasons. This implies that from Kotor the time needed to reach the open sea is about 1 hour and a half. Three hours would be dedicated just to this journey. Therefore, carrying out longer activities, with a larger and slower boat, gives the opportunity to carry out these activities in the necessary time, monitoring both the interior of the bay and the outside, allowing a pleasant navigation to the team and guests on board, thus creating a unique and high quality experience. (35)

Figure: Kotor, Montenegro

Next step in developing tourism product based on dolphin observation and protection in Boka Kotorska Bay is timing which is crucial for a product. If a product developer fails to select the best time for undertaking a tourism product it will be very difficult to sell it to tourists. Kotor is the city located at the end of an almost closed bay (Picture 8), which allows the navigation for calm conditions almost every day of the year.

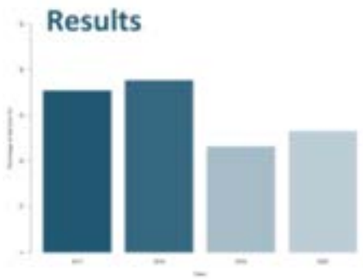

Figure: Results International Investigation on Bottlenose Dolphin presence in Montenegro (2017-2020)

After time defining, the next step for tourism product development is the pricing. The price of the product has an influence on the consumer's perception of important elements of the bundle on offer such as nature, dolphin observation, service quality, etc. In calculating the price, providers should consider the distribution channels of tourism products. (36)

Figure: Citizen science dolphin sightings in Boka Kotorska Bay

Marketing the tourism product is the next important phase in product development. A proactive marketing strategy is needed to entice potential travellers interested in dolphin observation and protection during the marketing phase. The marketing approach should be well-targeted with a well balanced marketing mix. It is important to study the market before starting and during the finalization stages of the product; to understand and pre-determine which market groups will be attracted to the offers of science-based tourism. (37)

During the Covid-19 travel ban, citizen science supplemented the data with key sightings.

Conclusion and recommendations

Protecting biodiversity is cruisal national and international importance. Many studies have shown the economic value of biodiversity and the ecosystem services it provides; and that this needs to be fully taken into account in planning and decision-making by all levels of government, the private sector and other stakeholders.

Research presented in this study shows the high value of biodiversity for tourism. Biodiversity is a vital component of the environmental quality and attraction of destinations for tourists, and needs to be protected for the long-term success of tourism. All stakeholders should be involved in minimizing, and where possible avoiding, adverse impacts from tourism on biodiversity. With the international recognition of the need to halt and reverse biodiversity loss, the time is right for all those involved in tourism – governments, at national, local and destination levels, the private sector and other stakeholders – to implement and strengthen policies and actions to help achieve this goal recognized also by UNWTO.

Science-based tourism can support sustainable use, conservation and management of biodiversity through the following ways:

• promoting the economic value of biodiversity conservation;
• promoting conservation by raising awareness among the local community and visitors; • generating additional funds for conservation from tourism.

Developing tourism products that support the protection and conservation of biodiversity in a destination requires joint actions with appropriate inputs from governments, site managers, indigenous people and local communities, and other stakeholders.

Data collected within this study contributes to a better understanding of the biology and ecology of the local bottlenose dolphin community, using marine area of Boka Kotorska, thereby contributing to the proactive monitoring and assessing the status of the population in the future. In order to ensure the above mentioned, following measures should be implemented:

• continued monitoring and research activities within the area of Boka Kotorska Bay in order to determine trends in population abundance (rise, fall, stagnation) and to get a more complete dataset on the home range and changes in the distribution of individuals that can be the result of anthropogenic disturbance;
• collecting further data on the relevant habitat characteristics and the distribution of bottlenose dolphins in the research area to perform an analysis of habitat use and to identify critical habitats/areas;
• It is necessary to continue to collect detailed information about the types and extent of anthropogenic activities in the research area as well as its spatial distribution that will help identify and re-evaluate areas where the population is under the greatest real or potential pressure;
• It is necessary to monitor fishing stock and the impact of particular fishing tools on the availability of prey to bottlenose dolphins and in particular, determine the extent of use of fishing tools specifically interacting with bottlenose dolphins.

Regarding the development of tourism product based on dolphin observation and protection in Boka Kotorska bay, these issues should be taken into consideration:

• When creating environmental impact studies as part of planned economic activities, it is necessary to ensure an assessment is made with reference to impacts on the bottlenose dolphin community and other cetaceans;
• When planning eco-tourism based on bottlenose dolphin watching, it is necessary to determine the carrying capacity for the number of boats involved in such activities and to create a fixed set of rules of conduct that will lower any negative impacts of an increased number of vessels following dolphin groups;
• It is necessary to continue to disseminate information to the public about the biology and ecology of bottlenose dolphins that will ensure a positive outlook towards the conservation of the marine environment and the organisms inhabiting it.

Considering that there is evidence to suggest that the bottlenose dolphin population is declining in Montenegro and the cause of this is unclear, further research and the precautionary approach with the help of citizen science is needed and recommended.

Notes

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